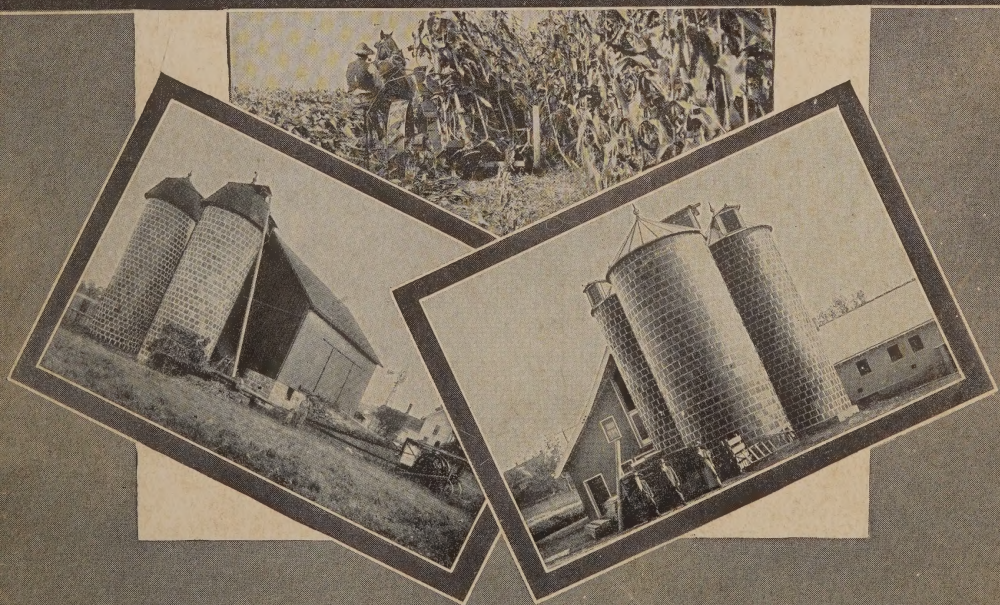
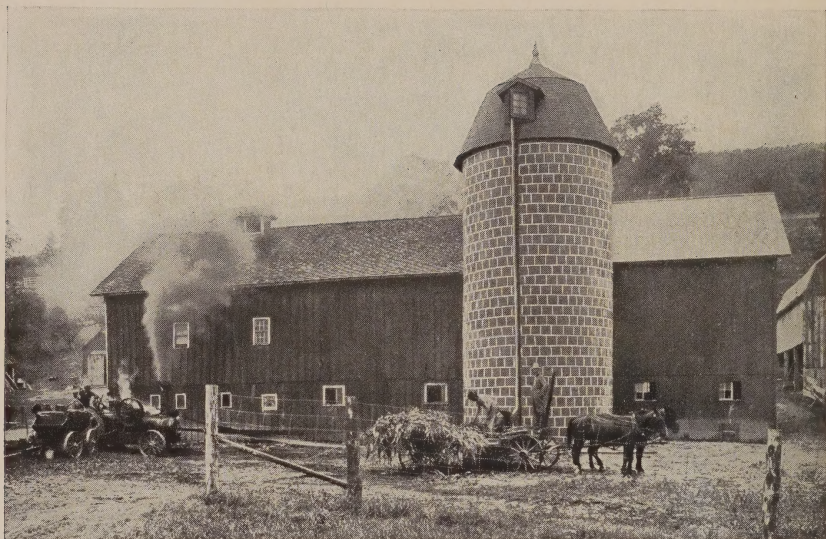


# The Silo That Lasts for Generations







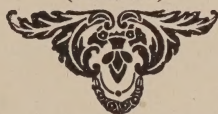
Natco Imperishable Silo, 16 x 32, on farm of Wm. Reynolds, near  
Syracuse, N. Y. Built 1914.

“The most durable things on earth are the hard burned clay bricks and tablets of ancient days. If the silo of vitrified clay tile is laid up well, with good cement mortar, and if it has proper reinforcement, it will be a legacy to the builder’s great-grandchildren.”

JOSEPH E. WING,  
*Breeder’s Gazette, June 18, 1913.*

**NATCO**  
**IMPERISHABLE SILO**  
Built of  
**Vitrified Hollow Clay Tile**

(Patented)



**“The Silo That Lasts for Generations”**

**National Fire Proofing  
Company**

Organized 1889

Capital \$12,500,000 - - 23 plants in the U. S. & Canada  
The Largest Company in the World devoted solely to  
the Business of Fireproof Construction.

**General Offices:**  
**Pittsburgh, Pennsylvania**

Agricultural Department Offices

Syracuse, N. Y.	Huntington, Ind.	Philadelphia, Pa.
Madison, Wis.	Bloomington, Ill.	Lansing, Mich.
	Pittsburgh, Pa.	

Copyright 1915

by  
National Fire Proofing Company



## Introduction

**B**EFORE looking this book over, you naturally would like to know exactly who we are and what we do. We'll tell you. The National Fire Proofing Company was organized in 1889, for the purpose of manufacturing fireproofing material for all kinds of buildings. We are now the largest organization of the kind in the world.

In the very beginning two guiding principles were adopted. These required, first, that this Company manufacture the best articles in its line; second, that it deal honorably and justly with every one.

These principles have been strictly adhered to. We have the complete confidence of builders and farmers wherever our products are known.

Year after year, we have been called upon to furnish the fireproofing for the magnificent skyscrapers of North America, until now a very large percentage of these great buildings are fireproofed with our material and by our methods.

Year after year, we have furnished conduits to the great electrical companies, until now there are thousands of miles of wires laid in conduits of our manufacture.

Year after year, we have continued to build grain elevators, now having a combined capacity of over 30,000,000 bushels.

Hundreds of fine residences and apartment buildings, built of Natco Hollow Tile, have made this material the standard for these types of buildings.

So have the hundreds of warehouses, creameries, garages, factory buildings, farm buildings of all kinds, built of Natco Hollow Tile, made for the special requirements of each type.

So have the thousands of Natco Imperishable Silos now in use. Owners are ever ready to testify to their great efficiency and economy.

Natco Hollow Tile do more than insure against fire. They are also proof against weathering, decay and frost. They are the most durable material known to man; history has proven this in the tile made by the ancients, which are practically intact to the present day. But Natco Tile are made of better clay and through better processes. They bid fair to last forever.

This book deals primarily with the construction and great efficiency of the Natco Imperishable Silo. Read it through carefully. The silo is the most important building on the farm. Build for strength. Build for permanency. Study the following pages and we are sure that you'll then determine that the Natco Imperishable is the silo for *you*.

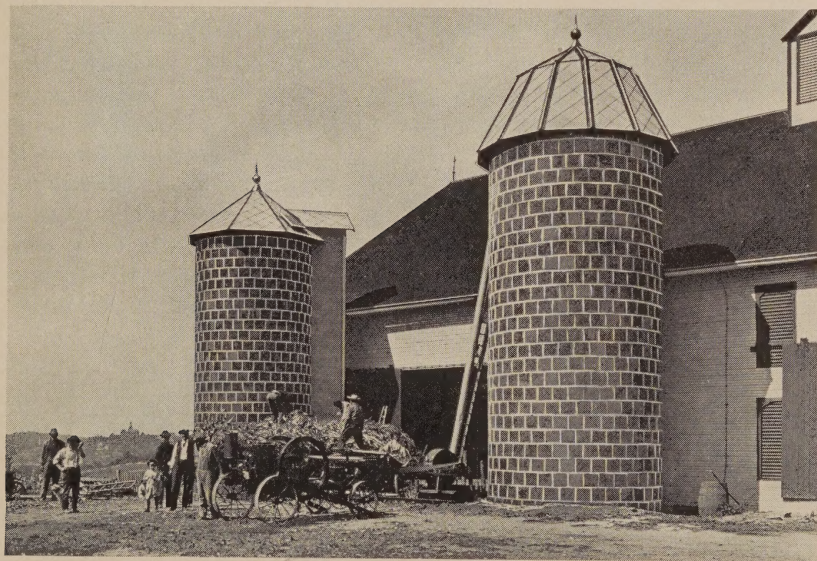


## THE REALLY UP-TO-DATE SILO MUST BE

1. A Perfect Ensilage Preserver.
2. Convenient.
3. Attractive.
4. Free of upkeep expenses and adjustment.
5. Durable.

From the pit silo up, through the succession of faults of the square silo, the round wood stave silo, the stone, cement block, solid wall cement, and brick silos, we have come to the ultimate structure which meets every requirement of the ideal and up-to-date ensilage preserver.

— We propose to consider each of the above requirements one by one, in their relation to the Natco Imperishable Silo, and believe the reader will acknowledge that our claims of Natco Imperishable Silo predominance have been fully justified in what follows.



Two Natco Imperishable Silos—one 12 x 30, built 1913, and one 12 x 32, built 1914—on farm of County Home, Cambria Co., Ebensburg, Pa.

### “NOT A BUSHEL OF DECOMPOSED SILAGE.”

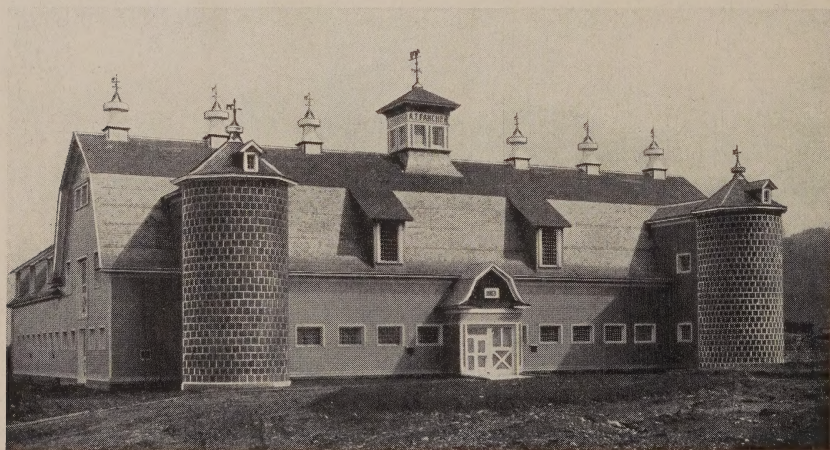
Unityville, Pa., Nov. 2, 1914.

Gentlemen:—My twin Natco Silos that I erected in 1913 kept the silage nearly perfect. I can truthfully say that I did not have a bushel of decomposed silage in the two after the top covering was off. Yours truly, A. G. EVERETT.



### Preservation of Silage.

A silo must first and foremost be considered for its ability to preserve feed perfectly, which requires that **the contents be kept away from the air**. Just so far as the air penetrates, the contents become rotten or moldy. Just so far as the air is excluded, the contents become good silage, provided there was sufficient moisture in the fodder at filling time. In all silos the forming of a glutinous air-tight mass by the rotting of the top layer of fodder is depended upon to keep the air from penetrating far downward. Therefore, it is an evident and proven fact that, other things being equal, such as the condition of the fodder, etc., **that silo will keep the silage best whose walls are nearest air-tight**. Any one who contradicts this does not understand the first principle of a silo. Any one claiming that a silo made from some particular material will keep silage better than those made from other materials, can only substantiate his claim by showing that his material makes a wall that is more nearly air-tight than the others. We **do** claim that Natco Imperishable Silos keep their contents in a superior condition. Our claim is based on the scientific fact that glazed walls are practically impervious to either air or moisture and this claim is backed up by the evidence of every one who has used one of our silos beside that of any other kind. We also claim that on account of dead air spaces in each wall tile there is less freezing of the silage than in any other silo. Then, too, the Natco Silo can be built taller and of smaller diameter than other silos, because it cannot blow over, thus exposing less silage to the air on top. We call attention to some testimonials along this line which are published in this book.



Twin Natco Silos on the farm of A. T. Fancher, Salamanca, New York.



### Convenience—No Infringement.

The up-to-date silo should be convenient. Practically all silos now on the market have convenient, continuous doors and a substantial ladder. The Natco Imperishable Silo is the equal of any of them in this respect, as a glance at our detail illustration on page 15 will show. Note, for instance, the splendid ladder front and the fact that there are no door clamps to be bothered with.

There has been considerable talk about some stave silo companies having a patent on continuous doors, etc. We thoroughly investigated the whole question. No one who has looked into the matter, not even the people who own the Harder patent, claim that we are infringers on that patent. We manufacture under our own patents and those leased from the Barnett and Record Company, and we not only assure the purchasers of our silos that they will never be bothered by infringement suits, but absolutely guarantee them against any loss whatever from such suits.



Three Natco Silos—one 10 x 30, one 12 x 30 and one 14 x 30—on farm of  
T. D. Underwood, Wauwatosa, Wis.

**“EASY TO BUILD, NEAT LOOKING AND DURABLE.”**

Cambria, Wis., Oct. 18, 1913.

Gentlemen:—I have just finished filling my Natco Imperishable Silo the second time. The silage kept good last year. I think you are putting out the best silo I have ever seen. Easy to build, neat looking and durable. Yours truly,

A. E. GIBBERD.



### Attractiveness.

Two farms may be equally well located, equally productive, and the buildings may have cost an equal amount of money. Yet the one having the most attractive buildings and surroundings will not only sell more readily, but bring more money. The owner, as well as the entire community, may feel a justifiable pride in the one farm which they cannot feel in the other. Appearance counts in dollars and cents. The fact is more clearly recognized all the time, and as a result proper construction and maintenance of farm buildings are constantly receiving more attention.

A silo on a farm usually indicates that the owner is a reading, thinking, progressive farmer. Still more to his credit is the kind of silo he builds. It is the most conspicuous building on the farm, and an attractive silo, which in addition has a look of strength and permanency, is a credit to his good judgment.

We are only stating a fact that is universally admitted by all who have seen them, when we say that the Natco Imperishable Silo is the most attractive in appearance of any silo upon the market to-day. The brown color of the tile broken by the white of the mortar joints is very pleasing. Like the color of autumn leaves, it harmonizes with nearly every other color. The roof is of the proper pitch to harmonize with the general form of such a structure and there is a distinctive appearance of stability and permanence that appeals to every discriminating observer. In short a Natco Imperishable Silo is a real ornament to any farm and long after other types of silos have decayed or crumbled, it will stand as an enduring monument to the wisdom and good judgment of the man who built it. It is a silo you'll be proud of.



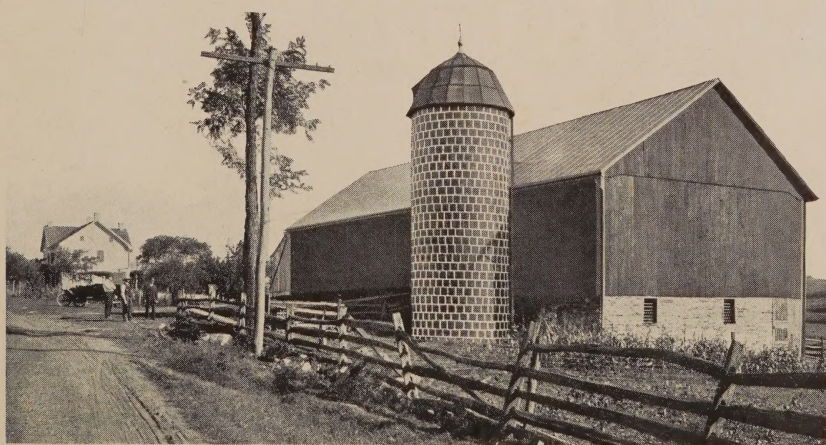
A 16 x 40 Natco Silo on farm of John Sauber, Virgil, Ill. Erected in 1913.



### Low Cost of Upkeep.

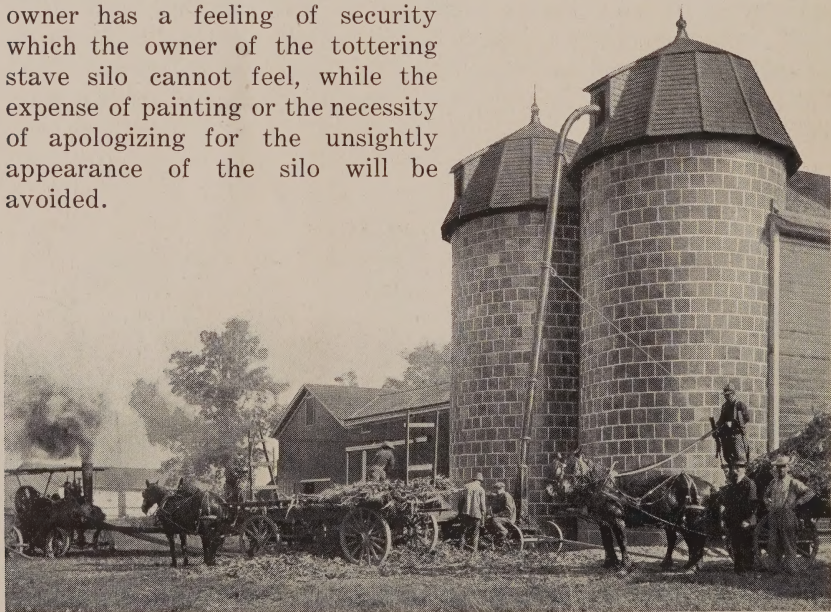
The first cost of any article is only one point to be considered. We all wish to be economical, but durability and cost of upkeep are as important factors in determining the cheapness of any article as is the money paid out when the purchase is made. Many a so-called cheap article is much more expensive and less satisfactory than one which costs a little more money. This is especially true of silos. The Natco Imperishable Silo costs more than a stave silo made from the cheap woods, such as tamarack or yellow pine. It costs little if any more than a stave silo made from the durable woods, as cypress or redwood, but in low cost of upkeep, in durability and in the satisfaction it brings the owner, no stave silo can compare with it.

The Natco Imperishable Silo never needs painting, re-erecting, straightening up or replacing on foundation after storms, and has no hoops to tighten. The cost of upkeep of a Natco Imperishable Silo should not amount to one cent for the first 15 years. Not until the roof requires re-shingling, or the doors begin to decay, will the Natco Imperishable Silo require any attention or expense. Compare this with the cost of upkeep of a stave silo. If built of cheap wood, such as yellow pine or tamarack, the silo will usually be painted when erected, again in three to five years, and sometimes the silo seems well enough preserved to warrant painting a third time. The cost will vary with the size of the silo, but will seldom be less than \$20.00 each time for two coats, and painting a large silo will cost much more. Thus in the one item of paint, the pur-



Natco Imperishable Silo on farm of J. C. Keller, Middletown, Md.

chaser of the cheap stave silo often pays out the difference between its first cost and the first cost of a Natco Imperishable Silo. If he buys a good stave silo, the first cost will be as great as the Natco Imperishable Silo and to this must be added the cost of upkeep. But painting is not the only expense incurred in maintaining a stave silo. A stave silo is practically a great barrel. If the hoops become loose enough to allow one stave to fall in, the whole structure collapses. To prevent this the owner must watch his silo during the summer when it is empty and at the proper time must get out his extension ladder and tighten the hoops. Perhaps the weather is hot, the threads on hoops and burrs rusty and there is other work demanding attention. Perhaps the owner cannot work on a shaky ladder twenty to forty feet from the ground. Anyway it is always an unpleasant and more or less dangerous task. The entire time required to keep the hoops tight should be charged to cost of upkeep. Even with the best of care many stave silos are wrecked each year by severe windstorms, many more are blown down and must be re-erected, while others are twisted out of shape and should be straightened. These repairs cost time and money and should also be charged to cost of upkeep. It is better to purchase a Natco Imperishable Silo at first. The summer may be dry and hot and the winds may blow but the owner has a feeling of security which the owner of the tottering stave silo cannot feel, while the expense of painting or the necessity of apologizing for the unsightly appearance of the silo will be avoided.



Twin Natco Imperishable Silos on farm of George A. Bridge, Batavia, N. Y.  
Erected in 1914.



### Durability.

No one who has seen a Natco Imperishable Silo has questioned its durability. The evidence of archæologists and scientists is to the effect that hard burned clay will actually outlast granite, and the evidence of the ages proves that in our northern climate, with its zero days of winter, torrid temperatures of summer, times of drought as well as seasons of extreme humidity, there are few materials known to man which have better withstood these varying and trying conditions than vitrified clay. Architects of the present day recognize this fact and nearly all of the great skyscraper buildings that are built in every other way to endure, have their exposed outer surfaces faced with vitrified brick or terra cotta, which is another vitrified product.

Vitrified clay is a fire clay or shale which has been burned in a fire so intense as to cause vitrification. Common clay will melt before it will vitrify. Webster defines a vitreous substance as similar to glass, but the fire clay or shale used in the manufacture of our silo tile is much the same as that used in the manufacture of paving brick, which is a product much less brittle than glass.

While soft clay products will absorb moisture and gradually wear or crumble, a vitrified material never crumbles because it absorbs no water. This non-porous quality is a valuable and necessary characteristic of an ideal silo wall, as a porous wall will absorb more or less moisture from silage.

The question which arises in the mind of the prospective purchaser of a vitrified tile silo is as to its strength. Will it break as a result of the lateral pressure of the settling ensilage? Some vitrified tile silos have broken, will not this? These questions are reasonable and we are glad to meet them. Now, it is a source of pride to be able to assert, without fear of successful contradiction, that of the many thousands in use, **not one single Natco Imperishable Silo has ever yielded to silage pressure or windstorms.**



Two 12 x 32 Natco Silos on farm of John G. Toennies,  
Albars, Ill. Erected in 1913.

Every one knows that vitrified tile silos are practically weather proof, storm proof, fireproof and acid proof, and now we say to you that if you erect a Natco Imperishable Silo on a good foundation in accordance with our plain directions, we will, if the silo breaks, cheerfully and without any quibbling, reimburse you for every dollar you have invested in labor or materials for the silo, and, in addition, pay you for any loss of feed or other loss which you may thereby sustain. This offer is made in good faith by a company which has built up and maintained a great business because it has always stood back of its product. We do not know how we can be more fair. We do not know what more we can do to make our customers feel absolutely secure in purchasing a Natco Imperishable Silo. Compare the security you may feel in purchasing a Natco Imperishable Silo with the insecurity which the purchaser of a stave silo must feel when he realizes that his silo is very liable to blow down or fall down and that if it does, he alone must stand the loss, while he knows positively that in a comparatively few years his silo must go to decay. Silage is moist and moisture never fails to cause wood to rot. If one stave or a part of a stave decays, air enters the silo, so the life of a stave silo is usually measured by that of its poorest staves. There is a manufacturing company who, in all its advertisements, uses the phrase, "Eventually, why not now?" Eventually you will purchase a Natco Imperishable Silo. Why? Because you cannot afford to get along without a silo. Because in from six to fifteen years your wood silo, should you buy one, will decay or be wrecked in a storm, and long before that time you will have recognized the truth of our claim that the Natco Imperishable Silo is the best and most economical silo that has been devised. Why not be wise enough to buy now?



Two 14 x 32 Natco Imperishable Silos on farm of James A. Lowe,  
Algonquin, Ill. Erected in 1914.



## THE NATCO IMPERISHABLE IS NOT A CEMENT SILO

When the Imperishable Silo is mentioned many people jump to the conclusion that it must be some form of cement silo. This erroneous idea we wish to correct. Cement is a wonderful building material and this and future generations owe a debt of gratitude to the present-day inventors and manufacturers who have made it so cheap and available. But while cement is such a valuable material in many places, experience has shown that, like every material, it has its limitations.

Cement silos cost about the same as tile silos and have many disadvantages, such as freezing of the silage, weakness of construction, faulty door systems, etc., which are overcome by the tile. It is very difficult to construct a good cement silo as there are so many details, such as, improper mixing of materials, poor settling, poor reinforcing, etc., which may cause the whole structure to be wrong and it usually takes longer to build a cement silo.

The cement wall, of necessity, is more or less porous and absorbs moisture from the silage, causing the pieces of silage to mold and contract, allowing the air to descend along the wall, causing further waste. A dry cement block submerged in water will absorb a surprising amount of water. It is true that a cement block silo will usually absorb more moisture than a solid wall, as the mixture for the block is not moistened more than is necessary during its manufacture. The result is that it is more porous than when the mixture is made more like slush when put in the molds. But at best, the man who builds a cement silo is experimenting.

The man who builds a stave silo knows that if he keeps the hoops tight and keeps the silo properly stayed, that he will have an efficient silo until it begins to decay, and so he is not experimenting. But the man who builds a Natco Imperishable Silo builds best of all. In theory it is the ideal silo. Eight years of trial have proven the correctness of the theory. Scientists have testified to the lasting quality of the material and architects and mechanics have approved the form of construction.

The Natco cannot absorb moisture. It cannot decay. The dead air spaces make the tile as nearly frost proof as any silo made. It is by far the most attractive silo on the market. And back of the Natco Imperishable Silo is a reliable company which guarantees it for a length of time sufficient to guarantee its strength.

Why run a risk when you can have a certainty? Why not have the best?

## CONSTRUCTION

A careful study of the various illustrations will, no doubt, make plain the details of construction better than words, yet some explanation may be of interest. Fully realizing the requirements of a perfect silo we have sought to embody, as herein illustrated, every feature of a silo, that is either essential or desirable. Our aim and purpose have been not to see how cheaply we could produce a silo, but how good a silo we could produce. That we have set the standard is the firm belief of the thousands of Natco owners.

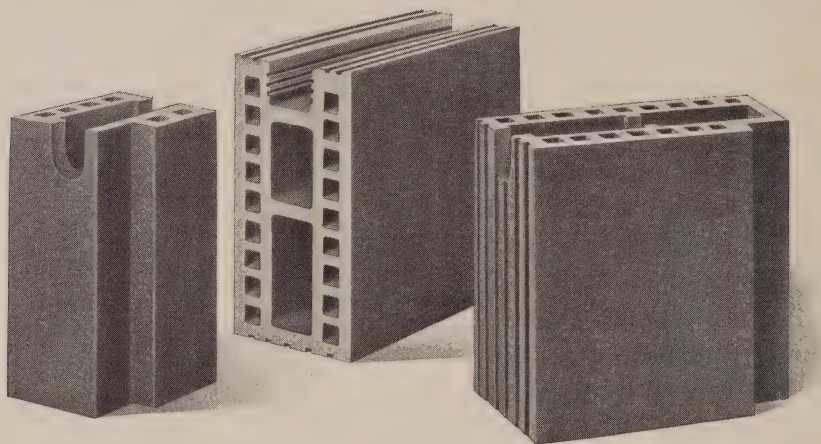


Figure 1.

The three kinds of tile used in Natco Imperishable Silos. The tile at the left and right are door jamb tile, used only at the door opening. The remainder of the silo is built of channel tile like that shown in the center. The dead air spaces, which prevent freezing, and the small tubular openings in the shell of each tile, providing an anchorage for the mortar, are also shown.

By referring to Figure 1 the reader will note the three kinds of tile that are used in the construction of Natco Imperishable Silos. The one at the left and the one at the right are door jamb tile which are used only at the door opening. The door jamb tile are perpendicular tile, that is, they stand on end, the air chambers extending up and down. The tile in the center in which the air chambers run horizontally is called the channel tile. Note also that with the exception of the doorway the entire silo is built from these horizontal channel tile. The channel in each tile is about one and three-fourths inches deep and two and one-fourth inches wide.

Any mechanical engineer will quickly recognize in our splendid type of channel tile, the ease with which a good, strong mortar



joint can be made. So, too, will the mason, be he amateur or expert, sanction at once the double shell feature on each side of the tile with its small tubular openings into which the mortar will clinch itself, thereby insuring absolutely air-tight and water-tight joints in every part of the silo wall. It would be hard for the man with the trowel to lay up our silo and make imperfect mortar joints, even if he tried, so ingeniously has the material been designed. This is why we may claim with propriety that our silo construction is actually "fool-proof."

Now as to reinforcement. This is an important matter, for the silo must be able to withstand the great pressure of the settling silage as well as the wind pressure of the severest storms.

### Two good methods of making foundations.



Figure 2.

Bottoms of foundations should be below the frost line, or from  $2\frac{1}{2}$  to 4 feet below the surface.

The only vitrified clay tile silos that ever failed were those not provided with steel reinforcement. Steel hoops around the outside of a silo provide ample strength but are not looked upon with favor by a majority of people. Wires laid in the mortar do not appeal to the practical man. In the Natco Imperishable Silo sufficient steel is used to withstand ten times the pressure that the silo will ever be called upon to carry. This method of reinforcement cannot be objectionable in the least, for the steel is placed in the silo wall where it can never be seen and is so protected from contact with the air that it cannot rust or deteriorate.

This construction embodies the same principles and is practically the same as has been used by this company and the Barnett and Record Company during the past ten years in erecting hundreds of grain elevators. These grain tanks, which have a total capacity of more than 30,000,000 bushels, average about eighty feet in height, the lateral pressure at the bottom being enormous; yet not one has ever broken. This construction, as used in the body of the silo, will be best understood by a study of Figures 1, 2, 3 and 4. The tile are six inches thick with faces twelve inches square.

How the channel tile are laid, the steel bands placed in the channels and then covered by cement mortar, will be understood by carefully studying Figures 2 and 3. The steel bands which encircle the silo are connected in every alternate course with the tie rods that cross the door opening, thus making the hoops complete every two feet as shown by the dotted lines in Figure 4. These tie rods form every alternate rung in the ladder, the other rungs being attached to the doors as shown in cut. This makes a convenient and thoroughly safe ladder front. How the steel bands in the other alternate courses are attached to the upright jamb posts which reach from tie iron to tie iron and which are surrounded by mortar is also best understood by a study of Figure 4 and a reference to the large jamb tile shown at the right in Figure 1. The result of this construction is, that with a bar across the door opening every two feet so that the silo is convenient to get in or out of, we have the effective strength of a steel band completely encircling the silo at every foot of its height.

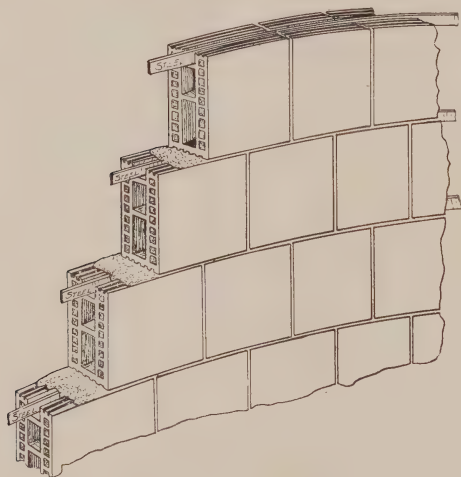


Figure 3.

The channel tile as used in the body of the silo. Note that the steel bands are laid in the channels and the channels filled with mortar. The masonry is simple and easily understood.

The advantage of having the bands embedded in mortar is easily understood. They are always of the proper tension and they cannot rust. The steel not exposed is not galvanized; the exposed steel parts are galvanized. This is in accord with our policy, which requires that we make the Natco Imperishable Silo just as good as we possibly can. All steel and iron parts are furnished ready for use as a part of the silo.

A chute is usually built between the silo and barn, down which the silage is thrown. We have made ample provision for attaching the chute to the silo by means of flat bolts, which are placed in the mortar joints between courses of tile. (See Figure 4.) By means of these bolts a scantling is fastened perpendicularly on each side of the door opening and these scantlings form a part of the frame of the chute.



## DETAIL CONSTRUCTION OF THE NATCO IMPERISHABLE SILO AT THE DOOR OPENING

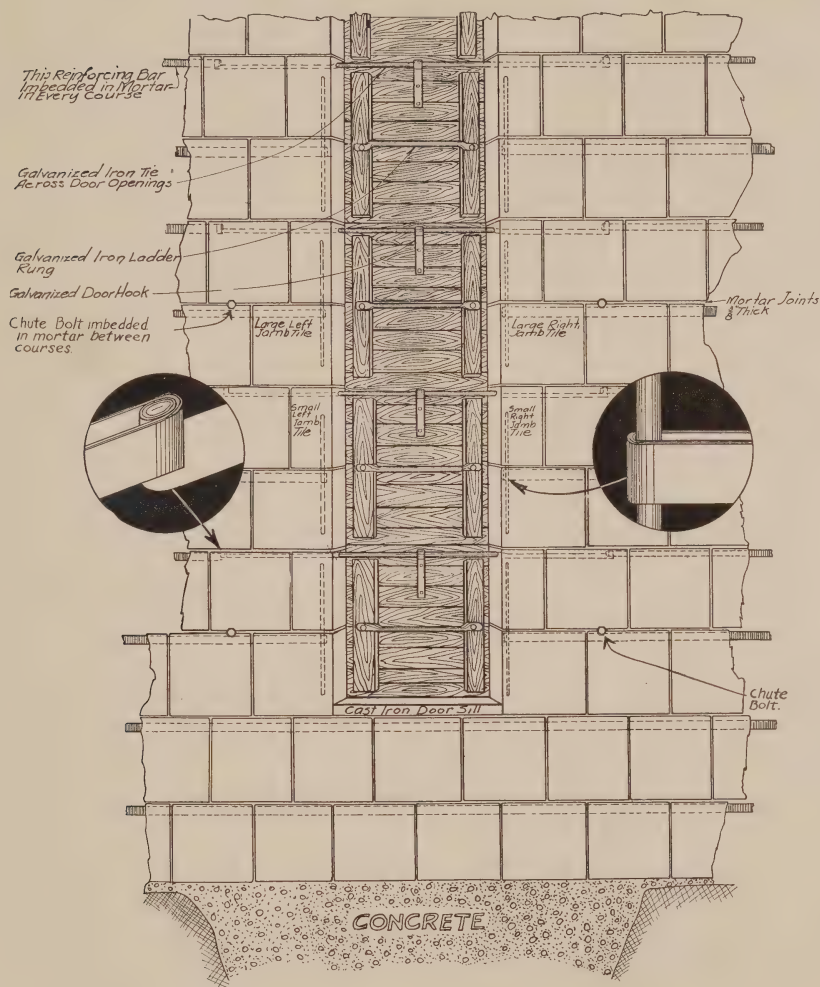
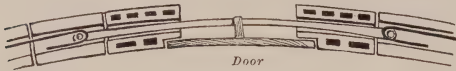


Figure 4.

The continuous door frame and doors of this silo merit the attention of all careful builders. Note the permanency, strength and convenience at every point. Also note that there are no clamps to bother with. Each door rests against the jamb tile, being held tightly in place by the hook over each reinforcing bar, and by the lateral pressure of the silage. The flat bolts by which the chute is attached are placed in the mortar joints between courses on either side of the door opening. Each door opening is really a separate unit and the **silos can be easily built taller at any time.**

## DOORS

As yet we have been unable to find any good substitute for wood for our silo doors. The roof frame and the doors are the only parts of our silo which can ever decay, but the lightness in



Notice space allowed for swelling. No sticking.

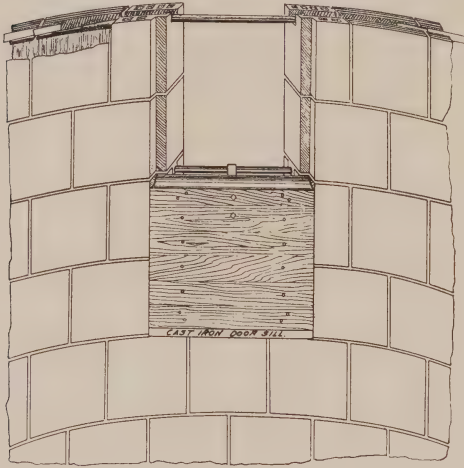


Figure 5.

Looking out from the inside.

This illustration shows how the doors fit into the door jambs. The special jamb tile are of the same material as the silo and can never rot or rust.

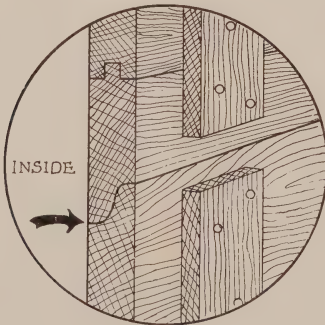


Figure 6.

Where the doors come together we use an O. G. joint. This is as nearly air-tight as a tongue and groove and not so liable to be broken. This is only one of the many little details that help to make the Natco Imperishable Silo ideal.

handling and ease in replacement by any carpenter or farmer handy in the use of tools, amply justifies the use of wood. We furnish either gulf cypress or redwood doors depending on available supply. In choosing this material we have selected the most durable woods that can be found for this purpose.

Strips of felt are attached to the edges of the doors where they come in contact with the jamb tile. This assures the exclusion of the air. When the silo is opened the first time after being filled, the top door should be safely stored, so that thereafter when a door is removed it may simply be pushed up and hooked on the bar above. Notice that the doors are flush with the silo wall. There are no projections to hinder the free settling of the silage; none around which air pockets may form.

To every purchaser of a Natco Imperishable Silo we send plain erecting instructions, illustrated in detail.



## THE ROOF



Notice how our Michigan Hip Roof is fastened to the tile—it can't be blown off. This hip style allows greater freedom of movement at filling time and adds 2 to 3 tons more capacity to silo.

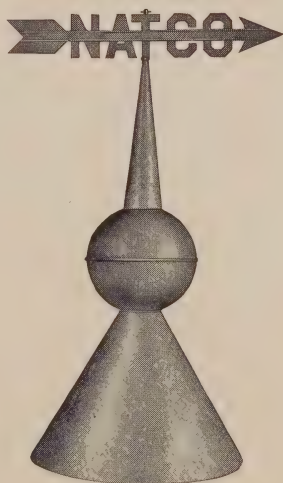
to eight tons more silage can be stored than where flat roofs are used, for the silage can be piled higher at filling time, and when it settles, will be nearly even with the top of the silo.

This "Michigan" roof frame costs nothing extra, as it is included in our quotation on the silo. We do not furnish any roof covering, as the buyer can usually purchase this at home nearly as cheaply as we can buy it. The felt or rubber roofings are most commonly used because more easily laid, but shingles, slate, tile, galvanized iron and tin are also used.

## ERECTION OF THE NATCO IMPERISHABLE SILO

The farmer erecting a stave silo usually secures the services of a carpenter to superintend the work. If erecting one of our Natco Imperishable Silos, he will secure a mason. Every community has its masons and the erection of a Natco Imperishable Silo is as simple a proposition for the mason as is the erection of a stave silo for the carpenter. The help necessary to tend the mason is usually on the farm.

Every good silo deserves a good roof. A symmetrical roof helps to make a silo an ornament to the farm. Any local carpenter can cut a roof frame, but without experience he is liable to make the roof too steep or too flat. We therefore send a roof frame with every silo. It is very pleasing in appearance, topping off a Natco Imperishable Silo in an efficient and attractive manner. We call it "The Michigan" type of roof, because it has the hip roof effect found on so many Michigan farm barns. The big advantage of this type of roof lies in the capacity added to the silo. From four

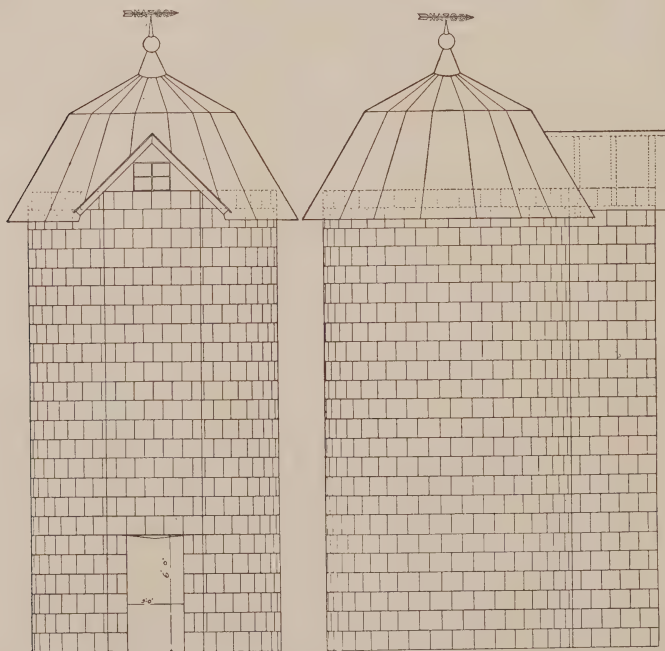


The neat finial and weather vane we send with your Natco Imperishable Silo. It caps the roof with an air of distinction and adds much to the appearance of your silo.

While the cost of erecting a Natco Imperishable Silo is somewhat more than the cost of erecting a stave silo, it should be remembered that the stave silo can hardly be considered complete when the carpenter has finished, for the stave silo should be painted. When the cost of paint and painting the first time is added to the cost of erecting a stave silo, it will be found that the same amount expended would have paid for the erection of a Natco Imperishable Silo of the same capacity. The foundation for the Natco Imperishable Silo may be of stone or cement. In Figure 2 we illustrate a foundation that has been used under hundreds of Natco Imperishable Silos.

## A SPLENDID TILE CHUTE

as illustrated below, can be furnished with each silo at a minimum additional cost. It is built of the same quality salt glazed tile as the silo and the tile which join the two are curved to fit the circumference of the silo wall. This insures a weatherproof junction. In every course there is a steel band, tying the chute firmly to the silo—the chute cannot work loose, settle, crack or get out of plumb. It is of standard size—4 feet by 3 feet, 9 inches inside—giving ample room. To make the outfit efficient and harmonious, we furnish a roof frame; also lintel over door. Prices and further details on request.



A Natco Tile Chute, as shown here, held to the silo by bands of steel in each course, is as strong, durable and attractive as the silo itself.



## THE SIZE OF SILO TO SELECT

Silage exposed to the air for several days spoils or dries out and becomes unpalatable. It spoils more quickly in warm weather than in cold weather. Silage exposed to the air for one day is all right. If exposed for two days it is not so good, though it will be eaten. If exposed longer it is not fit for feed. For sheep it should never be exposed longer than one day. The surface of the silage exposed to the air is in proportion to the square of the diameter of the silo in which it is stored. For example, the square of the diameter of a 10-foot silo is 100. The square of the diameter of a 12-foot silo is 144. The square of the diameter of a 14-foot silo is 196, etc.

It will be seen that as there is 44 per cent. more surface of silage exposed to the air in the 12-foot silo than in the 10-foot size, it would require that 44 per cent. more stock be fed from the 12-foot than from the 10-foot silo, to keep the feed equally as fresh. Now, experience has shown that from eight to ten cows fed from a 10-foot silo will eat enough silage so that a thin layer may be taken from the surface each day and the silage will always be fresh, juicy and palatable. Then if eight to ten cattle are required to keep the silage fresh in a 10-foot silo, as there is 44 per cent. more surface in a 12-foot silo, one should have from twelve to fourteen cattle to keep the silage equally as fresh. With these facts and principles to guide us we have compiled the following table:

DIAMETER OF SILO	Number of Cattle Required to Keep Silage Fresh
10 ft.....	8 to 10
12 ft.....	12 to 14
14 ft.....	15 to 20
16 ft.....	20 to 25
18 ft.....	25 to 32
20 ft.....	35 to 40
22 ft.....	45 to 55
24 ft.....	60 to 65
27 ft.....	75 to 80
30 ft.....	90 to 100
36 ft.....	130 to 150

Having decided on the best diameter of silo to build, the next question is in regard to the most desirable height. This will depend on circumstances. The average cow or two-year-old steer will

eat from 35 lbs. to 50 lbs. of silage per day. If the feeding season continues for 200 or more days as it does through most of the northern states, each mature animal will require from four to five tons of silage. Provision should also be made for the young stock, as there is no feed that keeps the youngsters growing so well and is as cheap as silage. Then the brood-sows and chickens should have their portion each day, and if sheep are kept, these, too, should be provided for at the rate of 3 to 4 lbs. each per day.

The owner of a silo usually keeps more stock than he has planned. Again he may keep more stock some years than in others. If his silo has a diameter so that he can feed a limited number and have the silage always fresh, yet has a capacity because of its height to feed a much larger number, then he has the ideal shape of silo. Silage carried over from year to year does not spoil, except a small amount at the surface.

It is true that the inexperienced usually hesitate about building a high silo. The danger of a high stave silo blowing down and the necessity of occasionally tightening the hoops, painting, etc., do not hold against the Natco Imperishable Silo, and the modern ensilage-cutter is warranted to put the corn into the silo fifty feet high. The task of climbing up to put down the ensilage is not so great as many people fear. In a 36-foot silo the silage will usually settle six feet before feeding begins. The first ten feet will feed off quite fast because it has not been compressed by weight above it. Now, you have 20 feet of good, solid silage left, that is packed down about as solid as cheese. Probably about three-fourths of your silage is in the lower twenty feet, and you are constantly lowering that. To sum up, from our experience, we never advise the building of a silo less than thirty feet in height and if one wishes to go higher, he will never regret it.

The dairyman will find that a silo of comparatively small diameter, for use in the summer, will usually pay for itself within one year. The silage fed in May and June lengthens out the pasture and in July and August when many a herd drops off one-half in milk production, the silage fed herd goes right on producing with only the normal shrinkage. Later in the season, with good prices for the milk, it does not take a great quantity per cow to pay for a silo.

The moral of this chapter is: Build a silo of as small a diameter as is consistent with your needs. And herein lies a big advantage of the Natco Imperishable Silo—it can be built taller and with smaller diameter than any other, for there is no danger of a blowdown.

We shall be glad to answer any question pertaining to silos and silage which any reader of this catalog may desire to ask.



## SIZES AND CAPACITIES OF NATCO IMPERISHABLE SILOS

We can furnish any size of silo desired. The sizes listed below are most common but if the size you would like is not given in the list, write us, telling us what size you would prefer and we will quote you prices. We urge upon our patrons the wisdom of purchasing a silo, the diameter of which is in proportion to the amount of stock that is to be kept. We never hear of a silo that is too high, but sometimes hear of the man who has a silo of too great diameter. The reason for this is given on pages 19 and 20.

SIZES				SIZES			
Inside Diameter	Height	Cap'y in Tons	No. of Cattle that Can be Fed 40 lbs. per day for 200 days	Inside Diameter	Height	Cap'y in Tons	No. of Cattle that Can be Fed 40 lbs. per day for 200 days
10	24	36	9	16	32	128	32
10	26	39	10	16	34	139	35
10	28	42	11	16	36	150	38
10	30	45	11	16	38	162	41
10	32	49	12	16	40	174	44
10	34	53	13	16	42	186	47
10	36	57	14	16	44	199	50
10	38	61	15	16	46	212	53
10	40	66	17	16	48	226	57
12	24	52	13	16	50	240	60
12	26	56	14	18	30	151	38
12	28	61	15	18	32	163	41
12	30	66	17	18	34	176	44
12	32	72	18	18	36	190	48
12	34	78	20	18	38	204	51
12	36	84	21	18	40	219	55
12	38	90	23	18	42	234	59
12	40	96	24	18	44	250	63
14	24	70	18	18	46	266	67
14	26	77	19	18	48	283	71
14	28	87	22	18	50	300	75
14	30	91	23	20	30	187	47
14	32	98	25	20	32	202	51
14	34	106	27	20	34	218	55
14	36	114	29	20	36	234	59
14	38	122	31	20	38	251	63
14	40	130	33	20	40	268	67
14	42	139	35	20	42	286	72
14	44	149	37	20	44	305	76
16	24	87	22	20	46	324	81
16	26	97	24	20	48	344	86
16	28	107	27	20	50	365	91
16	30	117	29				

### "ABSOLUTELY NO WASTE SILAGE."

New Jersey Agricultural Experiment Station,  
Dairy Department,  
New Brunswick, N. J., Sept. 22, 1914.

National Fire Proofing Co.

Dear Sirs:—Our Natco Imperishable Silo, erected last season, has given exceptionally good results during the past year. The ensilage kept in excellent condition, and we had absolutely no waste. Careful observations were made during the time the silage was removed, as we were especially interested in the keeping qualities of such a silo, and I am glad to report that there was absolutely no waste silage.

Very truly yours, ALFRED S. COOK, Dairy Husbandman.

## PRICES, TERMS AND GUARANTY

For prices it is best to write to the nearest office or inquire of one of our local agents or salesmen as, on account of freight, the prices vary in different states. The prices we will quote will be for the silo delivered at our expense to the purchaser's nearest steam railroad station and will include practically all of the material used in the construction of the silo except covering for the roof and the necessary cement, sand and gravel. There is a printed price list for each state and as we have fixed the price very low, we cannot accept orders at less than our printed price, while any order taken at a higher price will be corrected to make the price conform to the printed price. We believe this is the only honorable way to deal. The reader will realize that the prices we ask for Natco Imperishable Silos are low if he will compare the cost of one of our tile, which has a face one foot square, with the cost of a two-inch plank one foot square. He should also consider that the iron, the doors and every part of our silo are of the very best material. The doors are made from gulf cypress or redwood, according to best available supply, these woods being extremely durable. Settlement is required when silo is delivered, either by note payable September 1, without interest, or if cash is paid on delivery, a discount is allowed.

On the back of every order and made a part thereof is a three year guaranty, copy of which is shown on the next page of this catalog. This guaranty means all that it implies. In order to safely make a guaranty we must require that the silo be erected in conformity to our printed instructions but we say to every purchaser, it is just as easy to erect the silo in accordance with these instructions as according to some inexperienced man's ideas. It costs only a little more to make a good substantial foundation than to make one which might prove inadequate. It costs no more to erect the silo early enough to allow the mortar to thoroughly harden than to wait until it is time to fill the silo. We have every reason to believe that the Natco Imperishable Silo will stand for centuries. No silo or grain bin constructed on these principles has ever broken.

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### THE UNIVERSITY OF WISCONSIN.

College of Agriculture and Agricultural Experiment Station,  
Madison, Wis., Oct. 12, 1914.

National Fire Proofing Co.

Gentlemen:—We have used the Natco Imperishable Silo for one year and wish to state that we are very well pleased with it.

Very truly yours,

GEO. C. HUMPHREY,  
Animal Husbandry Dept.



## Guaranty

*The National Fire Proofing Company, a corporation organized and existing under and by virtue of the laws of the Commonwealth of Pennsylvania, does hereby guarantee that the material to be furnished for the erection and construction of a Natco Imperishable Silo, which it has this day sold to \_\_\_\_\_ of \_\_\_\_\_, is suitable for said purpose, and if said Silo shall be erected upon a proper foundation and constructed in accordance with printed instructions furnished to the purchaser and shall not be filled for a period of two weeks after its completion; the National Fire Proofing Company further guarantees the purchaser, for a period of three years from the date hereof, against any and all loss or damage which may be sustained by the purchaser due to the cracking or breaking of said Silo, as the result of ensilage pressure, or from said Silo being blown down or damaged by winds, except damage to the roof.*

NATIONAL FIRE PROOFING COMPANY,

*Pittsburgh, Pennsylvania.*

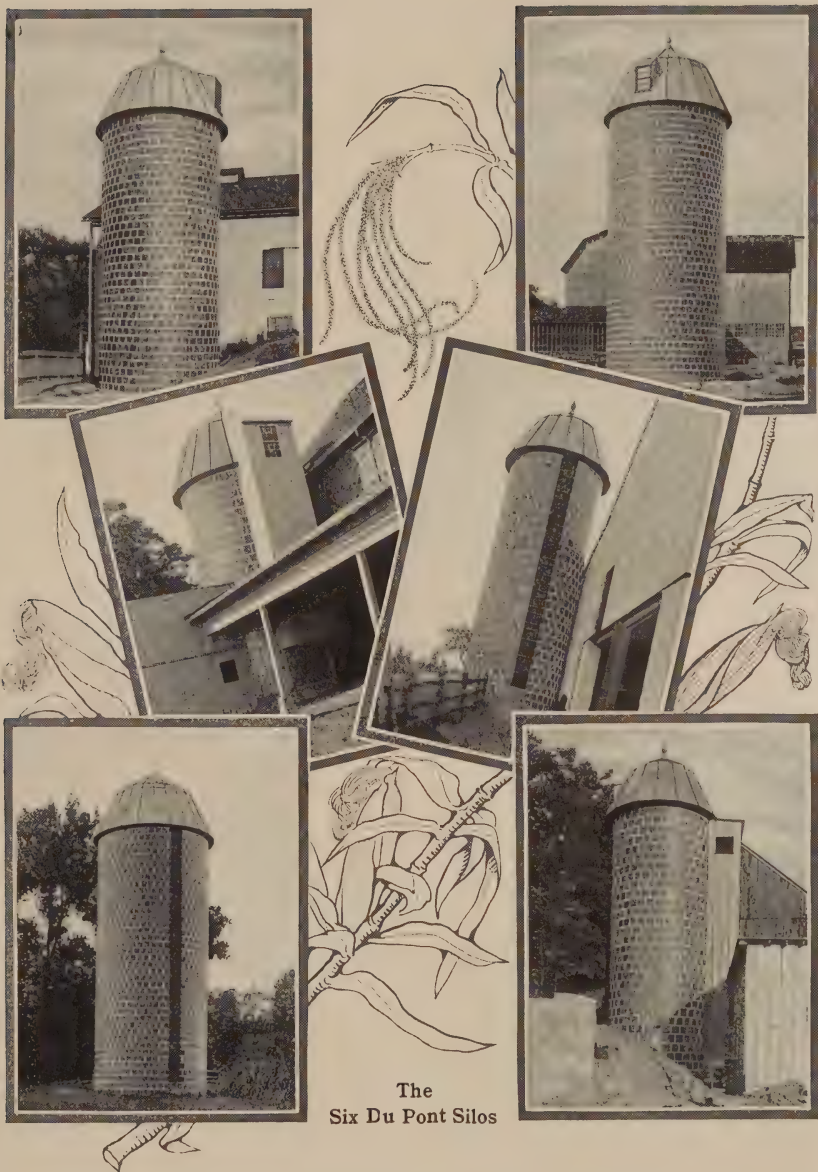


Two Natco Imperishable Silos, 14 x 36, on farm of August M. Schiller,  
McHenry, Ill. Erected in 1912.



Nine Natco Imperishable Silos owned by D. L. Quirk, Jr., Ypsilanti, Mich. Seven were bought in 1912 and two more in 1913. Read Mr. Quirk's testimonial on page 26.





The  
Six Du Pont Silos

The above Natco Imperishable Silos were erected on the farms of the Hon. T. Coleman Du Pont of Wilmington, Delaware. Many men of prominence, especially manufacturers, masters of detail, thus recognize the superiority of "The Silo That Lasts for Generations."

# THE EXPERIENCE OF THESE REPRESENTATIVE AMERICAN FARMERS SHOULD PROVE INTERESTING AND SUGGESTIVE



Two Natco Silos, one 18x36 and one 20x48, on farm of James E. Sague, Poughkeepsie, N. Y.

## THIS MAN OWNS 9 NATCO SILOS.

Ypsilanti, Mich., Oct. 19, 1914.

Gentlemen:—We want you to know of the very satisfactory results we are getting from our Natco Imperishable Silos. As you know, we originally put in seven and later put in two more. We have, therefore, tried seven of them for two years and two for one year. The ensilage comes out in fine condition and our stock is in the best of condition. We consider the hollow tile silo the best on the market and are well pleased with yours.

Yours very truly,  
DANIEL L. QUIRK, JR.

## “FOR SUMMER FEEDING.”

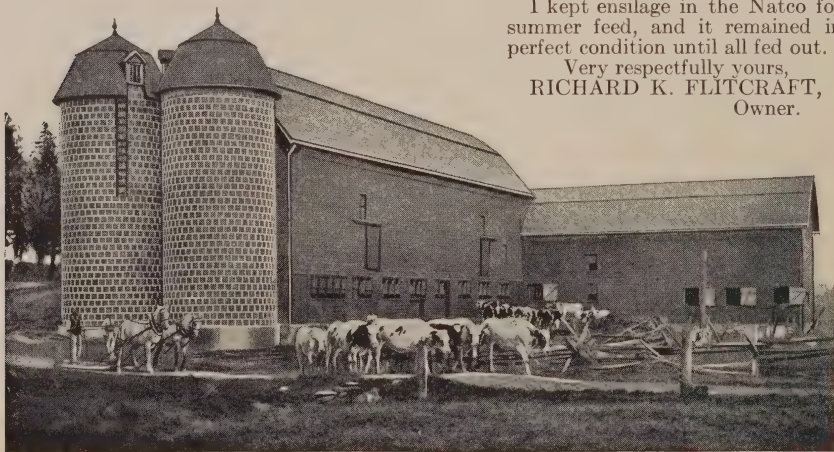
Cream Valley Dairy, Woodstown, N. J., Oct. 12, 1914.

Gentlemen:—Any testimonial that I can write cannot express my satisfaction with the Natco Imperishable Silo purchased two years ago.

I have two wooden stave silos and there is quite a loss of ensilage, particularly where the staves come together at the ends, and the losses are increasing each year, while with the Natco there is positively no loss; and I do not believe there will be any in this century.

I kept ensilage in the Natco for summer feed, and it remained in perfect condition until all fed out.

Very respectfully yours,  
RICHARD K. FLITCRAFT,  
Owner.



Two 16x34 Natco Imperishable Silos on farm of Geo. E. Lewis, near Newton, N. J. Built 1914.



**"FED FROM SEPTEMBER  
TO AUGUST."**

Three Bridges, N. J., Nov. 9, 1914.

Gentlemen:—I am much pleased with the Natco Imperishable Silo I erected in 1913. I commenced feeding the 12th of September and fed until first of the following August and I never had any spoiled silage. The cows ate every bit. I have received many compliments on its appearance and I consider it the "best ever."

Very truly yours,  
THEO. H. DILLS.



**Natco Silo on farm of New Jersey Agricultural  
Experiment Station, New Brunswick, N. J.**

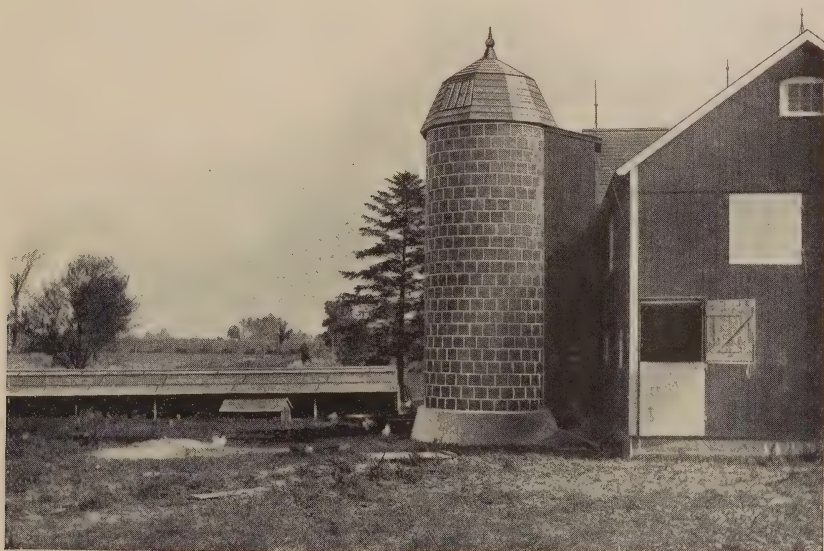
(See testimonial on page 21.)

**"THE SILO STOOD ABSOLUTELY UNINJURED."**

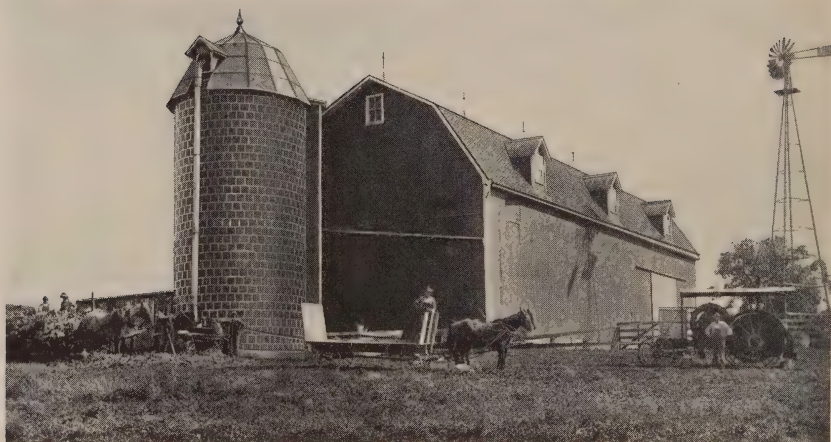
Galva, Ill., April 10, 1913.

Gentlemen:—Having decided about a year ago to build a silo, I chose your Natco Imperishable because I believed it would be permanent. The silo was located just outside of a new circular barn. On March 23, 1913, a tornado took the roof off the barn, took the windmill down and wrecked other smaller buildings and played havoc with near-by trees and a straw stack. One section of the barn roof about twelve feet square was carried almost half a mile over the fields. During all of this destruction the silo stood absolutely uninjured and bears mute testimony of its imperishable construction. The silo has preserved the ensilage well. During the coldest weather only a very small amount froze on top around the edges. Yours very truly,

J. W. MORGAN.



**10x24 Natco Imperishable Silo on farm of A. D. Snellbaker, Woodstown, N. J. Built 1914.**



16x34 Natco Silo on farm of H. C. Reading, Richmond, Ill. Erected in 1913.

**“WISH WE HAD TWO OR THREE MORE NATCOS.”**

Princeton, Ill., June 18, 1914.

Gentlemen:—We are very much in favor of the Natco Imperishable Silo for the reason that the tile are glazed so hard that they do not absorb the moisture as much as the wooden silos do, and as we all know it is the moisture in the silage that makes it keep, the more of it that can be retained in the silage the better it will keep. We are very firm believers in the silo and only wish that we had two or three more Natco Silos.

Very truly yours,

PADDOCK & RAWSON.

**“I AM GOING TO BUILD ANOTHER.”**

Okemos, Mich., July 20, 1914.

Gentlemen:—I have one of your Natco Silos, 16x36, built last year and I am well pleased with it. I am going to build another silo, 12x30, this year.

Very truly yours,

M. A. BRAY.



10x30 Natco Silo on farm of John L. Mitchell, Caro, Mich. Erected in 1913.





Two 16 x 40 Natco Imperishable Silos on farm of P. M. Sharples,  
West Chester, Pa. Erected in 1913.

### THE SHARPLES SEPARATOR CO.,

West Chester, Pa., Oct. 19, 1914.

Gentlemen:—We have just filled the two Natco Silos on our dairy for the second time. Our Dairy Manager tells me that they are highly satisfactory in every way.

One thing regarding them that particularly appeals to me is their substantial and attractive appearance. In a dairy of our kind this is a feature of considerable importance. Very truly yours,  
P. T. SHARPLES.

### “FED FROM NOVEMBER TO MAY.”

Austin, Ind., Aug. 24, 1914.

Gentlemen:—The silo I purchased of you in 1912 has been one of the most successful investments I have ever made. During the winter of 1912 before I purchased the silo, I fed thirty-six acres of good corn to about twenty head of cattle. Last fall I put ten acres of corn in the silo and fed eighteen head of cows and calves from the first of November until the latter part of May. I am just completing the erection of another Natco, 12x36. In my opinion, any silo is a good investment, but when it comes to getting value received, I consider the Natco in a class by itself.

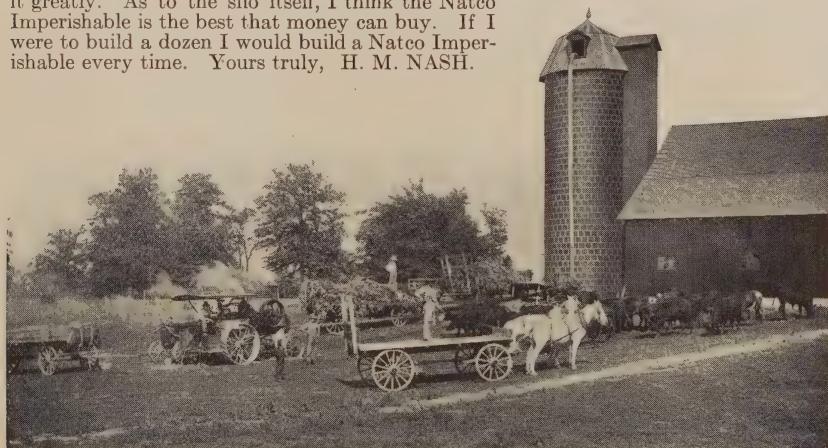
Yours truly,

D. W. BLOCHER.

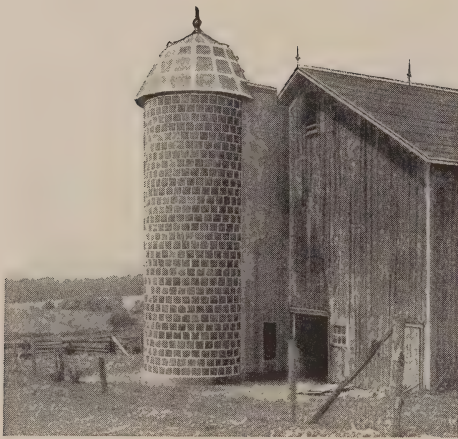
### “WOULD BUILD A DOZEN NATCO SILOS.”

Rushville, Ind., Nov. 25, 1912.

Gentlemen:—I am feeding silage to thirty head of heifers and they seem to relish it greatly. As to the silo itself, I think the Natco Imperishable is the best that money can buy. If I were to build a dozen I would build a Natco Imperishable every time. Yours truly,  
H. M. NASH.



An 18 x 40 Natco Imperishable Silo on farm of James A. Boyd, Cambridge City, Ind.



12 x 32 Natco Silo on farm of Basil Morrison,  
Mercer Co., Transfer, Pa.

**"SILAGE IN FINE CONDITION ALL THE WAY TO THE BOTTOM."**

Johnstown, Pa., Oct. 18, 1913.

Sirs:—Your Natco Imperishable Silo has given entire satisfaction. My silage kept very good, and was in fine condition all the way to the bottom of silo.

The silage did not freeze in it. Silo is in a direct sweep from Laurel Hill Mountain to the Allegheny Mountains.

My elevation is 2000 feet. Several wood silos blew down this summer in this neighborhood. Your silo I believe is storm proof, fireproof, and as near frost proof as can be made.

Yours,  
R. M. LUTHER.

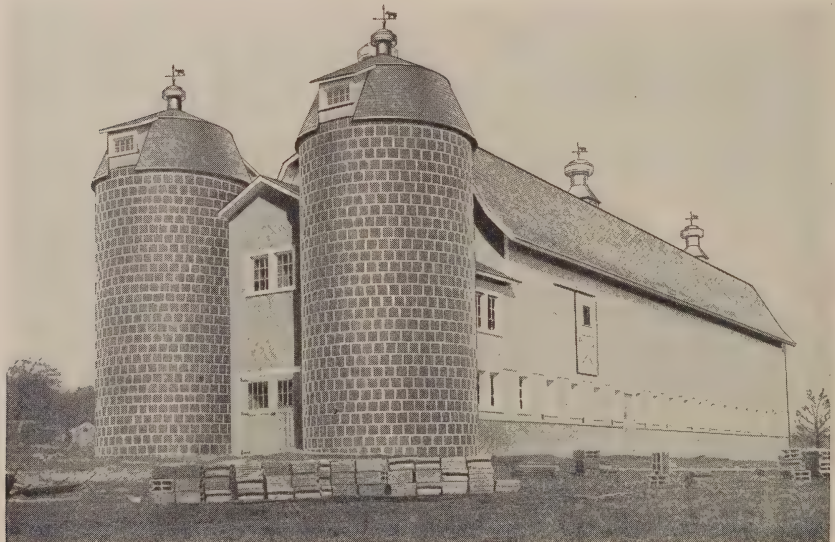
**"THE SILOS HAVE STOOD AS PERFECT AS WHEN BUILT."**

Chicago, Ill., Aug. 6, 1914.

Gentlemen:—The three Natco Imperishable Silos, 18x40, which I placed on the Columbian Ranch at Eldred, Greene County, Ill., last fall, were filled and gave good satisfaction. We put in especially good foundations which gave five feet additional depth for ensilage. The silos have stood as perfect as when built, and we expect them to be practically everlasting with the ranch on which they are built.

Very truly yours,

EDW. BOYLE.



Twin Natco Imperishable Silos on farm of Brown & McMillan, Waukesha, Wis.

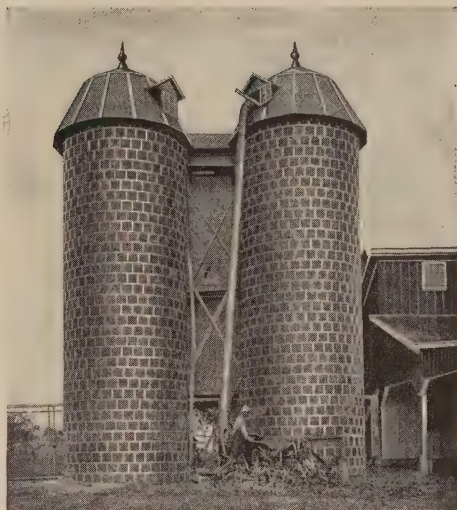


**"NO SPOILED ENSILAGE IN  
YOUR SILO."**

Avondale, Md., Nov. 3, 1914.

Gentlemen:—We are very much pleased with our Natco Imperishable Silo. It keeps the ensilage in fine condition and we consider it the best one on the market, very much superior to the wooden one we have. In taking the ensilage out of the wooden one there is quite a good deal at different places around the edge that the air gets to and spoils. We do not find any spoiled ensilage in your silo at all after taking off the top.

Yours respectfully,  
JAMES W. BEACHAM & SON.



Two 12x38 Natco Silos on farm of C. H. Basschor,  
Cambridge, Md. Built 1913.

**"GAINED 160 LBS. TO THE STEER."**

Masontown, W. Va., July 27, 1914.

Gentlemen:—I am pleased to say that the 12x30 Natco Imperishable Silo purchased of you last year has given satisfaction in every way and is all you claim for it. The ensilage has kept in perfect condition. The coming two-year-old steers that we fed through the winter with no extra grain, only the ensilage, came out sleek and nice with a gain of one hundred and sixty pounds to the steer.

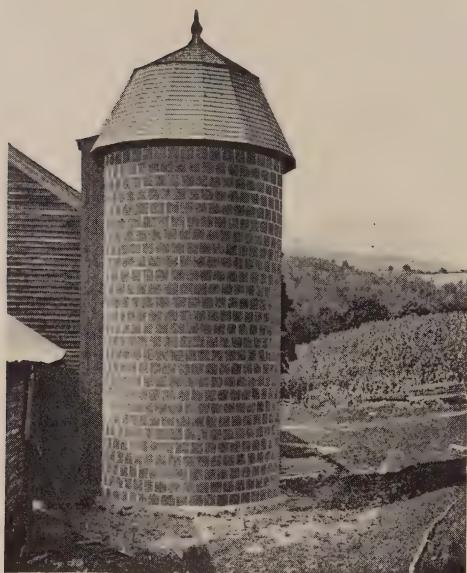
Yours very truly,

C. E. McMILLEN.



12x30 Natco Imperishable Silo of S. D. Hughes, Wheeling, W. Va.





14x30 Natco Silo on farm of Boyd S. Read,  
Blairstown, Warren Co., N. J. Built 1913.

## "THE IDEAL SILO."

Steuben, Wis., Oct. 13, 1914.

Gentlemen:—I can heartily recommend the Natco Silo. I have had one in use for a year and have it filled for the second time. It has proved to be an ideal silo. In the first place it is imperishable; second, practically frost proof; third, the glazed finish on block prevents drawing of moisture from contents, which is a very essential part of a silo. Ensilage in a Natco is just as good on the outer surface as in center. This is why I can safely recommend the Natco Silo.

DELOSS CURTIS.

## "CHEAPEST SILO ON THE MARKET."

Carlinville, Ill., Aug. 2, 1914.

Gentlemen:—The Natco Imperishable Silo I purchased of you last year has proved perfectly satisfactory. Quality considered, the Natco is the cheapest silo on the market.

Yours truly,

C. E. BERG.

## "FED 30 HEAD OF CATTLE FROM NOVEMBER TO MAY."

Georgetown, Del., Oct. 16, 1914.

Gentlemen:—I am very much pleased with my Natco Imperishable Silo, 14x30. The ensilage kept fine. It fed 30 head of cattle from November to May. I would not have anything in the silo line except a Natco.

Yours truly,

G. FRANK JONES, M.D.



Natco Imperishable Silos on farm of Delaware State College, Newark, Del.,  
one stuccoed on outside.

**"STOOD THE TEST OF  
SEVERE WIND STORMS."**

Middleton, Wis.,  
Sept. 15, 1914.

Gentlemen:—The Natco Imperishable Silo I purchased of you last year has proven very satisfactory. The silage kept perfectly, and froze very little. I had 20 tons of silage left when I quit feeding May 10th and when the pastures were dry during the summer's drought, I fed the remaining silage, which was good to the last. I consider the Natco Silo the most profitable investment a farmer can make, and will last a lifetime without further attention, besides being an ornament to any farm. The Natco Silos in this vicinity have stood the test of severe windstorms this summer while many others were blown down. To any one wishing a permanent silo, I can recommend the Natco Imperishable. Yours very truly,

E. F. WITTENBURG.



Natco Silo on farm of F. A. Brick, Seymour, Wis.

**"THE NATCO WILL TAKE THE LEAD."**

Marion, Ind., June 25, 1914.

Gentlemen:—The Natco Imperishable Silo bought of you in 1912 has given perfect satisfaction. We have several kinds of silos in this locality but should I ever build another it will surely be a Natco. I look for the Natco Silos to take the lead after they have all been put to a test.

Yours truly, J. G. BROWN.




14 x 24 Silo on farm of R. Lee Davis, Mauravici, Ind. Built 1914.



### "A-NO. 1 SERVICE."

Colver, Pa., June 19, 1914.

Gentlemen:—The two 12x30 Tile Block Silos we purchased from you June 23, 1913, have given us "A-No. 1" service. We have never had any leak. We filled these silos Sept. 18, 1913, and are still using the ensilage, and will have enough to run us until about July 10th, and I want to say that the ensilage is in as good shape now as when we first opened the silos.  Yours truly,

COLVER DAIRY FARM,  
(Signed) H. R. Griest, Manager.

### "CONSIDER IT THE BEST INVESTMENT I EVER MADE."

R. F. D. No. 4, Morgantown, W. Va., June 22, 1914.

Gentlemen:—I am so well pleased with my silo that I can heartily recommend it to my neighbors. No freezing to amount to anything, and our corn had gotten too dry but the Natco kept it in fine condition. After we commenced feeding, there was not one bit of waste during the winter. The cows ate it all and did the best they ever did and so much cheaper. It is, or I consider it, the best investment I ever made. I wish you the best of success.

Yours very truly, D. P. RUNNER.

### "HAVE A PAIR OF TWINS."

Lake City, Mich., Jan. 14, 1914.

Gentlemen:—I purchased a Natco Imperishable Silo and had it erected upon my farm near Lake City last year. Filled it last fall and am now using the ensilage. It makes a handsome structure and when once built you are through with it. It needs no repairing or attention of any kind. The ensilage is coming out in splendid condition. I have just ordered another one like it which I will have erected alongside the one erected last year and will then have a pair of twins.

Very truly yours,  
F. O. GAFFNEY.

### CREAMERY MANAGER "RECOMMENDS NATCO SILOS."

Detroit Creamery Co., Detroit, Mich., Nov. 26, 1912.

Gentlemen:—The Natco Imperishable Silos erected on our Ingleside farm are more than satisfactory, and I can assure you that I can cheerfully recommend them to anybody that is in need of a silo.

Yours truly,  
A. EASTER, General Manager.



Three Natco Silos on farm of Detroit Creamery Co., Mt. Clemens, Mich.





A 12 x 30 Natco Silo on farm of Rev. W. J. Beamer,  
Adams Co., Guldens, Pa. Built 1913.

### “LAST WORD IN SILOS.”

Staunton, Va., Oct. 14, 1914.

Gentlemen:—The 12x34 Natco Imperishable Silo I bought in the summer of 1913 is highly satisfactory. To have my mind entirely relieved from fear that it will be blown down is a great relief as I had two wooden ones blown down. In the language of one of my neighbors, it is the last word in silos.

Yours very truly,  
R. G. KOINER.

### “BEAUTIFUL—SERVICEABLE—IMPERISHABLE.”

Meadow Brook Farm, Quarryville, Pa., Oct. 10, 1914.

Gentlemen:—The 14x34 Natco Silo I purchased from you is filled. The silo arrived in the roughest weather we had last winter, yet we hauled it four miles without breaking one block. Neither my mechanic nor myself had ever seen a tile silo but we erected it without any trouble. When we were filling our silo a neighbor voluntarily placed his order because he was convinced that it was not only beautiful but serviceable and really imperishable.

Yours truly, WILLIAM P. BUCHER.

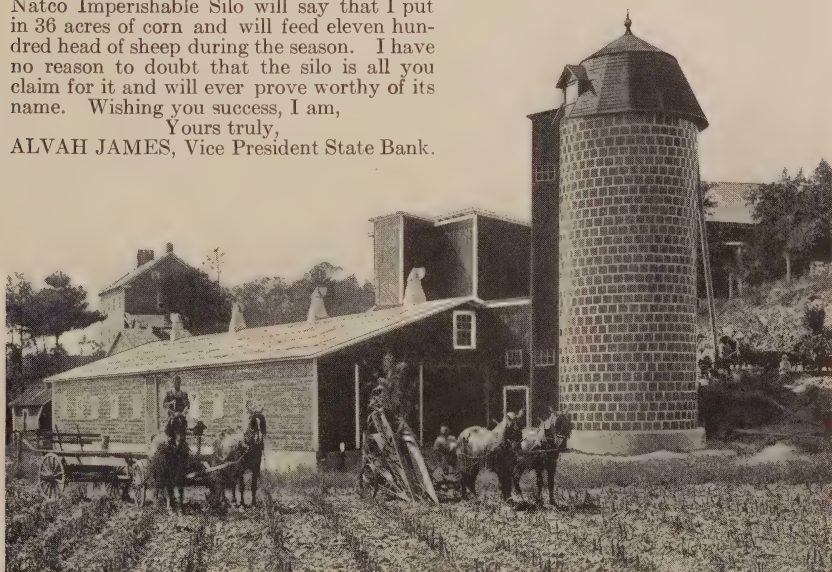
### “WILL FEED 1100 SHEEP.”

Mansfield, Ill., Nov. 26, 1912.

Gentlemen:—Concerning my 18x50 foot Natco Imperishable Silo will say that I put in 36 acres of corn and will feed eleven hundred head of sheep during the season. I have no reason to doubt that the silo is all you claim for it and will ever prove worthy of its name. Wishing you success, I am,

Yours truly,

ALVAH JAMES, Vice President State Bank.



14 x 34 Natco Imperishable Silo on farm of I. F. Read, near Blairstown, N. J. Built 1913.

**"SEES NO REASON WHY IT WILL NOT LAST INDEFINITELY."**

The  
Connecticut Agricultural College,  
Storrs, Conn., May 15, 1914.

Dear Sirs:—Our Natco Imperishable Silo has proved entirely satisfactory and I am very much pleased with it. I can see no reason why it will not last indefinitely and continue to be in every way a first class silo.

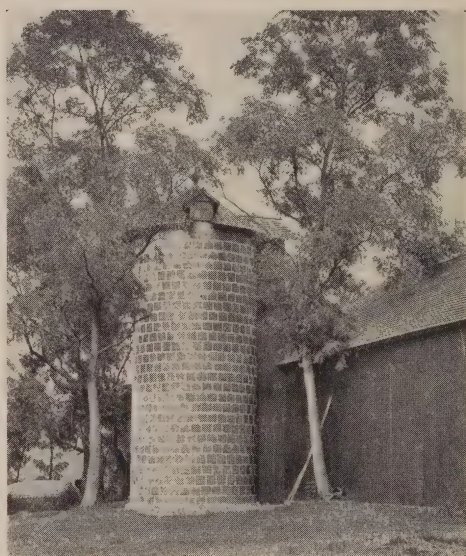
Yours very truly,  
H. L. GARRIGUS,  
Farm Superintendent.

**"BEST SILO FOR THE MONEY."**

Rushville, Ind., Aug. 21, 1914.

Gentlemen:—I will say for the Natco Imperishable Silo, it is the best silo for the money. My silo has been in use two years and silage was in fine shape both years.

Yours truly,  
H. M. NASH.



Natco Silo on farm of E. W. Hazen, Haddam, Conn.

**"SILAGE KEPT PERFECTLY AT 22 BELOW ZERO."**

Bellefontaine Gardens, Lenox, Mass., Feb. 15, 1914.

Gentlemen:—The Natco Imperishable Silo which we purchased from you last summer has given eminent satisfaction so far. The ensilage has kept perfectly and during the extremely cold weather in January (temperature as low as 22 degrees below zero) it did not freeze to any great extent.

Very truly yours,  
EDWIN JENKINS, Supt.

**"I AM PROUD OF IT."**

Boonville, Ind., Aug. 24, 1914.

Gentlemen:—My Natco Imperishable Silo gives entire satisfaction. It preserves the ensilage perfectly, is a beautiful structure, and seems likely to endure forever. I am proud of it.

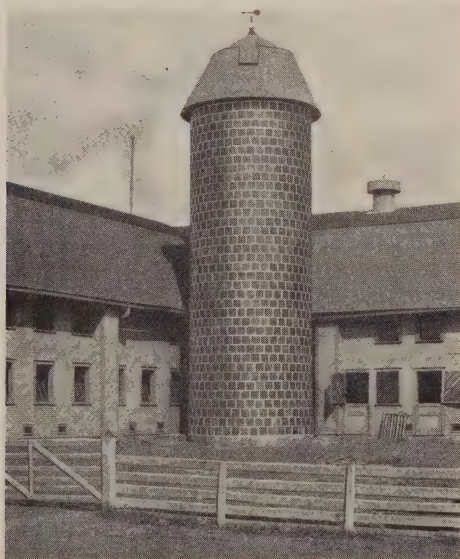
Sincerely,  
WORTH CARTER.

**"SILAGE KEPT PERFECTLY."**

Auburn, N. Y., Aug. 20, 1913.

Gentlemen:—The Natco Imperishable Silo has worked in every respect very satisfactorily. No freezing. Silage kept perfectly. It is a thing of beauty too. If I were to buy another, for anything I have seen yet, it would be the Natco Imperishable.

Yours truly, B. P. COGSWELL.



Natco Silo, 14 x 40, at Purdue University,  
Lafayette, Ind.



**"NO ONE CAN SAY TOO MUCH FOR THE NATCO."**

Mt. Solon, Va., Oct. 13, 1914.

Gentlemen:—The Natco Imperishable Silo bought of you and erected last year has been more than satisfactory. It keeps the ensilage perfectly and has beautified my farm more than the cost of the silo. No one can say too much for the Natco Silo and no one will ever make a mistake by buying one.

Very truly yours,  
M. BRUCE WHITMORE.

**"WE MADE NO MISTAKE."**

Redford, Mich., Sept. 14, 1914.

Gentlemen:—The 14x30 Natco Silo purchased of you two years ago has given perfect satisfaction in every way. We are now feeding ensilage that was put up the first year and it is in good condition. We feel that we made no mistake when we purchased a Natco Imperishable Silo.

Yours very truly,  
HOUGHTON BROS.



12 x 36 Natco Silo on farm of Daniel L. Landis, Jr., Chambersburg, Pa.

**"ENSILAGE KEEPS MUCH BETTER."**

Ijamsville, Md., Oct. 1, 1914.

Gentlemen:—the Natco Imperishable Silo purchased of you last year is all right in every way. We have had a stave silo for years but find the ensilage keeps much better in the Natco Silo than in the old stave one. No one will make a mistake by purchasing one of your silos.

Respectfully,  
JOHN W. MOLESWORTH, Jr.



12 x 38 Natco Silo on farm of T. B. Hayward, Harmony Grove, Md. Built 1913.



**TO THE WISE** these testimonials should be just about enough evidence that the Natco Imperishable Silo is all that we claim it to be. The experience of others is always valuable, for though our *own* experience is the best teacher, it is often the most expensive.

Remember, we gladly furnish on request the **NAMES OF NATCO OWNERS IN YOUR STATE**. By this means you can see for yourself just what the Natco Imperishable Silo is, for there are probably one or more of these silos right near you. Owners are glad to talk about their Natcos, for the simple reason that they are enthusiastic about the efficiency of same.

**“ 700 GALLONS MORE MILK.”**

Anderson, Ind., May 25, 1914.  
Gentlemen:—I am well pleased with my Natco Silo. If I was buying another would surely buy one of the same kind. In six months with 15 cows I got 700 gallons more milk than the year before with 17 cows. Very truly yours, C. M. CORBET.

**“ BEST SILO ON THE MARKET.”**

Green Bay, Wis., Oct. 22, 1914.  
Gentlemen:—I am well pleased with my Natco Imperishable Silo. I think it is the best on the market. It costs a little more than some but I don't regret one penny. Yours truly, JOHN PUISSANT.



Natco Imperishable Silo on farm of Wm. Badke, Milwaukee, Wis.

## NATCO GLAZED BUILDING TILE FOR ALL TYPES OF FARM BUILDINGS



Barn and Corncrib. Built of 8 x 8 x 16 Natco Glazed Hollow Building Tile.

Natco Glazed Building Tile are used for barns, houses, chicken houses, root cellars, etc. The rapidly growing demand for this type of construction is accounted for in the following questions and answers. Study them carefully.

1. Will the building be of the required strength and fully protect the contents from all conditions of weather?

Properly erected, no stronger buildings exist than those made of Natco Tile. As an example, take the immense grain elevator bins built of Natco Tile, or the thousands of Natco Silos over the country not one of which has ever burst. These were reinforced of course. But take houses and barns built of Natco Tile, which are not reinforced. They are safer than concrete, for they are unaffected by any changes of weather and temperature.

2. How long will it last?

The building made of Natco Hollow Tile will last for generations. No limit to its endurance if erected by a competent mason.

3. How soon will it need repairs and to what extent?

Except for the parts of wood on the roof and interior furnishings, the repairs for Natco Glazed Tile buildings need not be considered. We make sills, lintels and other types of tile, to do away with outside wood entirely.

4. Is it fireproof?

Buildings constructed of Natco Hollow Tile are fireproof. Worth something to you when you have a full silo, mow or grain bin, isn't it?

5. What is the cost of material and labor for erecting?

Natco Glazed Building Tile save time, labor and money in erecting. Owing to their lightness, Natco Tile are handled more easily and quickly than any other building material and cost less for laying. In size,



Barn built of 8 x 8 x 16 Natco Glazed Hollow Building Tile.

Send for our new book on Hollow Tile Buildings for the farm.  
Valuable, interesting, timely.



these tile are about twelve times that of an ordinary brick which enables you to erect a wall more quickly and with less expert labor. The cost of cartage is also less than for brick or stone.

6. Will it be attractive in appearance?

Natco Glazed Building Tile make permanent and attractive buildings. The rich brown surfaces of these tile, contrasted with layers of mortar, make a very attractive appearance and eliminate the necessity of frequent painting.

7. Will it be rat proof?

With Natco Tile the building is proof against *all* vermin.

8. Will it be sanitary?

Natco buildings offer the greatest opportunity in building for perfect sanitation. Nothing to hold moisture, dust or odors.

9. Does the type of structure allow every convenience?

There is no architectural convenience which cannot be had with Natco buildings. The finest office buildings in the world, some of the most modern homes, barns and silos, etc., in the United States and Canada are built of Natco Tile.

10. In the case of a house, can the latest designs and most beautiful effects be used?

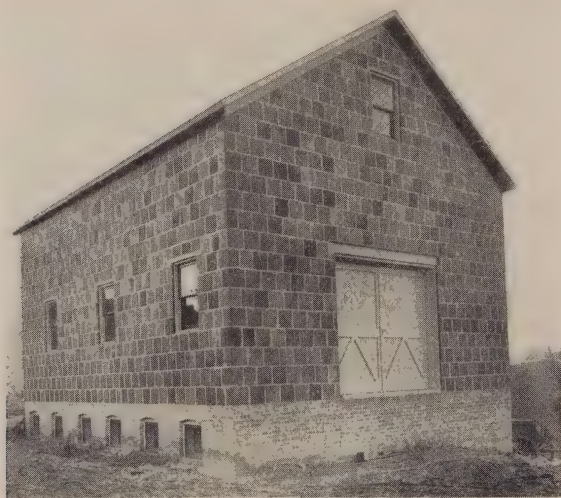
With Natco Hollow Tile, the builder has



Meat House built of 8 x 8 x 16 Natco Glazed Hollow Building Tile.



A Natco Glazed Hollow Building Tile.

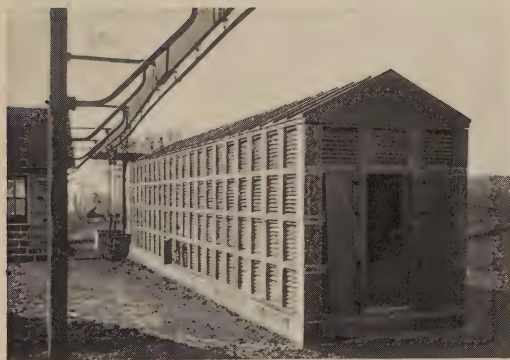


Barn built of 8 x 12 x 12 Natco Glazed Tile.

a large choice of materials. If you prefer stucco or rock face to plain face finish, there are tile for that purpose. And they're sold the same price to all. The man of small means can erect a house just as cheaply, in proportion, as can the man who buys on a large scale. Every building is a little different proposition. But there is a Natco Tile for every type. And our advice on building construction is yours for the asking.

Bring your building desires or troubles to us. No obligations, remember.

## THE NATCO HOLLOW TILE CORNCRIB



Corncrib. Built of Natco Hollow Glazed Tile. Capacity, 1100 bu.

perfectly ventilated, yet effectively excludes rain and snow. It cannot decay or have moldy, dark corners. Has no cracks or crevices to harbor insects. "Clean as a whistle"—and easily kept so. Like the Natco Imperishable Silo, it is an attractive building of brown tile marked with sharp white lines of mortar. Corn stored in the Natco Corncrib will keep its color. It will make better seed and when ground will produce meal free from mildew, dirt and odor. It is one unit and needs no lining. Quickly and easily erected.

The price of the Natco Crib is within the reach of every farmer. Details as to dimensions, construction, etc., furnished upon request.

### Warehouses, Creameries, Garages, Etc.

are constructed with the greatest economy with Natco Glazed Building Tile. Co-operative associations, farmers' leagues, and selling organizations, etc., will do well to consult us before erecting their buildings. We'll give every case the closest attention and our experience will be of value to you. Free consultation on farm building construction. The great value of Natco buildings lies not only in their durability and protection from frost, etc., but in the appearance they give your business—an air of permanence and prosperity is about them.

Your yearly loss of corn from rats, mice and mildew in the wooden crib would astonish you, if you would or could figure it carefully. The wooden structure usually has poor ventilation and damp, dirty corners. In a short space of time it decays, falls to pieces, and is a disgraceful looking building. It's liable to burn at any time, too. The durable, handsome Natco Hollow Tile Corncrib overcomes all of these objections. It is rat and mouse proof, decay proof and fireproof. It is



Creamery. Built of 8x8x16 Natco Glazed Hollow Building Tile. This building is about 60x125 ft. and one story in height.



Warehouse. Built of 8x8x16 Natco Glazed Hollow Building Tile. Front part used for stable, rear portion used for furniture storage, separated by tile partition.





House built of Natco Rock Face Glazed Building Tile.

## BUILD A HOME YOU'LL BE PROUD OF

To have an attractive and durable home should be the ambition of every man no matter what his occupation may be.

What are you living for—to build an imposing array of excellent farm buildings, to maintain highest efficiency in the management of the farm and to the exclusion of home comforts? Or are you living for your *home* and your family, making the other buildings merely tributary to its beauty?

Travel this country over, and see how very few farm homes show the attention they should have. The barns, silo, hog houses, etc., are often placed first in importance, even if the owner is wealthy, and the dwelling house comes last.

Investigate the beautiful permanent construction of Natco Hollow Tile residences. We can show you examples innumerable of Natco homes erected at moderate cost that are an everlasting joy to the owner.

There's no building of wood that cannot be duplicated in Natco Hollow Tile at small additional cost and you have something that will *last*—no repairs or painting. Glazed face, rock face, or cement (stucco) face may be had as desired.

## NATCO HOLLOW TILE FOR RESIDENCES

The invention of Natco Hollow Tile revolutionized building methods—simplifying erection, affording absolute protection from fire and insuring a permanent independence of all weather conditions.





House built of Natco Hollow Tile (rough faced) with an outside coat of cement plaster or stucco. Neat, attractive, durable.

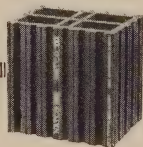
The use of Natco Tile started where the need of such material was most apparent—in the great skyscrapers of the cities—and played an important part in their development. The next development was Natco Tile for smaller buildings.

Natco Hollow Tile for residences are of the highest grade of the same terra cotta material which gives to skyscrapers a really fire-proof construction, except that they have different form and size to meet the requirement of strictly bearing walls without steel reinforcement.

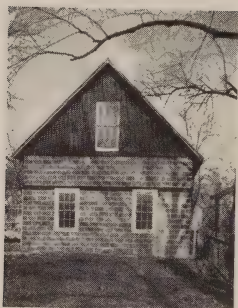
The latest tile is the Natco XXX (Patented). It is unlike any other, having a double cross web, the shell coming in direct alignment and under complete compression.

As with Natco Silos and other buildings, the Natco house cannot burn, nor be affected in the slightest degree by dampness, changes of temperature or age. Natco houses need no painting or repairing. They are warmer in winter and cooler in summer, because the dead air spaces completely blanket or insulate the structure, and the material itself does not take in heat, cold or moisture as does wood, brick or stone.

Any style of house may be built—any size, too. There are many different forms of Natco Tile—jamb tile, sill tile, lintels, slabs, fillers, floor tile, etc. Be sure to secure the genuine Natco Hollow Tile. It may always be distinguished from its inferior imitations by the trade mark, "Natco," pressed into the surface of every genuine Natco Hollow Tile.







Barn. Built of 8x8x16 Natco Glazed Building Tile.



Exterior view of Natco house before stucco is applied.

## WHY NOT HAVE A "NATCO" FARM?

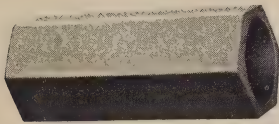
As one by one your old frame buildings get out of repair, rebuild each with Natco Glazed Building Tile. Then before you realize it, you'll have a "Natco" farm—a group of buildings that will endure for generations. What great satisfaction you'll have as each is completed, when you can say, "There, that's built for good." No more repairs, except to those parts that are made of wood. And think of the feeling of security you'll have—no more fear of storms or fire. Everything in every building will be perfectly safe—cheapest kind of insurance. Many farmers are now building this way, and as you drive through the country you'll see springing up here a house, here a barn, here a granary, milk house, carriage house, garage, hog house,—all built of Natco Glazed Building Tile. The "Natco" habit is one that grows—and one you'll never regret. Better send at once for our new book on Natco Hollow Tile for the farm. And remember, too, that we're always glad to answer

questions on building construction without obligating you in any way. Plan right now for some *permanent* buildings. Let us hear from you.



Note the appearance of permanency and prosperity that this splendid silo and barn have. The silo is an 18x36 and the barn is 40x150. Both are built of Natco material. High Hill Dairy Farm, Pulaski, Pa., on which they are located, has thus settled the barn and silo question, for good.

## NATCO DRAIN TILE



Made of good grade shale, properly burned. Laid right, they last indefinitely. We have not sacrificed durability for porosity, for the quantity of water that will pass through the walls of the tile is unimportant. Practically all the water enters at the joint.

### CARRYING CAPACITY—GALLONS PER MINUTE

The following table will show the number of gallons discharged per minute for specific sizes and grades of Tile and will assist in determining the size of tile to be used in the work.

Size of Tile	Wt. per foot	1½ in. fall per 100 ft.	3 in. fall per 100 ft.	6 in. fall per 100 ft.	9 in. fall per 100 ft.	1 ft. fall per 100 ft.	18 in. fall per 100 ft.	2 ft. fall per 100 ft.
3 in.	5 lbs.	21	30	42	52	60	74	85
4 in.	7½ lbs.	36	52	76	92	108	132	148
5 in.	10 lbs.	54	78	111	134	159	192	219
6 in.	13 lbs.	84	120	169	206	240	294	338
8 in.	20 lbs.	144	208	304	368	432	528	592
10 in.	30 lbs.	267	378	563	655	803	926	1340
12 in.	40 lbs.	470	680	960	1160	1360	1670	1920

Where Drain Tile larger than 12 in. in diameter is required, it is best to use No. 2 Sewer Pipe.

Minimum car load of Drain Tile is 24,000 pounds.

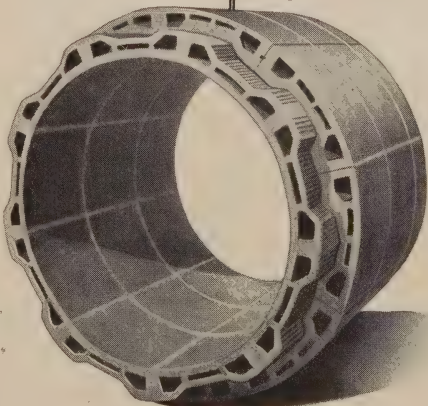
### NATCO LOCK JOINT SEWER TILE

for storm or sanitary sewers, water conduits, intakes, culverts, septic tanks, etc., have great structural strength, perfect and permanent resistance to frost, dampness and age. Salt glazed, tight, everlasting. Less expensive than brick or cement and laid more quickly. Highway commissioners and boards of improvement will find it profitable to consult us before establishing a drainage system. Our long experience will save time, labor and money.

Minimum car load, 50,000 pounds. Sizes as follows:—

Inside Diameter	Number Double Tile Per. Ft.	Weight per Lineal Ft.	Thickness of Shell
30 in.	8	400 lbs.	6 in.
33 in.	9	435 lbs.	6 in.
36 in.	9	450 lbs.	6½ in.
39 in.	10	500 lbs.	6½ in.
42 in.	11	550 lbs.	6½ in.
45 in.	11	575 lbs.	6½ in.
48 in.	12	600 lbs.	6½ in.
54 in.	14	700 lbs.	6½ in.
60 in.	15	900 lbs.	8 in.
66 in.	17	1020 lbs.	8 in.
72 in.	18	1080 lbs.	8 in.
78 in.	20	1200 lbs.	8 in.
84 in.	21	1260 lbs.	9 in.
90 in.	23	1472 lbs.	9 in.
96 in.	24	1608 lbs.	9 in.

Full section 36 in. diameter, 6 ft. long, suspended 24 hours after being laid up. Any part of any section shows the same strength in a similar test.





# Natco Grain Elevator

## Lesson to the

Silo construction and grain elevator construction embody the same principles of efficiency. They are similar in form and the problem of each is to provide efficient holding of contents that exert great outward pressures on the walls.

In the grain elevator the strains are much more severe because of the heavy stresses exerted by the thrust of the grain. Read this list of Grain Elevators built since 1900 representative of the standard of NATCO HOLLOW TILE:

	BUSHELS		BUSHELS
Anheuser-Busch, St. Louis, Mo.	330,000	Morris Grain Elevator, Morris, Ill.	25,000
Bernhard Stern & Sons, Milwaukee, Wis.	290,000	North Star Malt. Co., Minneapolis, Minn.	600,000
L. B. Best Co., Granite City, Ill.	75,000	Northwestern Yeast Co., Chicago, Ill.	250,000
Canada Malting Co., Montreal, Can.	100,000	Pabst Brewing Co., Milwaukee, Wis.	100,000
C. P. Ry., Elev. "D," Ft. William, Ont.	400,000	Paterson Brewing Co., Paterson, N. J.	40,000
Can. Northern Ry. Co., Port Arthur, Ont.	7,500,000	Peavy Duluth Term'l Co., Duluth, Minn.	700,000
Ch'go Gt. Western Ry. Kansas City, Kan.	500,000	Pillsbury Flour Mills Co., Min'polis, Minn.	380,000
C. B. & Q. Railway Co., Harlem, Mo.	1,400,000	Quaker Oats Co., Cedar Rapids, Iowa	180,000
C. M. & St. P. Railway Co., Coburg, Mo.	525,000	Quaker Oats Co., Battle Creek, Mich.	38,000
Cleveland Grain Co., Indianapolis, Ind.	400,000	St. Anthony El. Co., Minneapolis, Minn.	2,000,000
Consolidated El. Co., Ft. William, Ont.	1,000,000	St. L. & San Fr'cisco Ry., Rosedale, Kan.	275,000
Consolidated El. Co., Duluth, Minn.	600,000	Schlitz Brewing Co., Milwaukee, Wis.	500,000
Detroit Milling Co., Adrian, Mich.	5,000	St. Law'ce Flour Mills Co., Montreal, Can.	250,000
William Dow & Co., Montreal, Can.	98,000	Standard Mills, Armourdale, Kan.	200,000
Empire Elevator Co., Ft. William, Ont.	1,200,000	David Scott, Detroit, Mich.	90,000
Gt. Eastern El. Co., Minneapolis, Minn.	900,000	Victoria Elevator Co., Minneapolis, Minn.	250,000
K. C. Ft. Scott & Memphis, Rosedale, Kan.	200,000	H. Walker & Sons, Walkerville, Ont.	86,000
L. S. & M. S. Ry. Co., Indiana Harbor, Ind.	225,000	Washburn Crosby Co., Buffalo, N. Y.	200,000
Wm. Lemp Brewing Co., St. Louis, Mo.	650,000	Western Term'l El. Co., Ft. William, Ont.	1,000,000
Minn. Linseed Oil Co., Minneapolis, Minn.	150,000	Wis. Malt & Grain Co., Appleton, Wis.	193,000
Milbourne Mills Co., Philadelphia, Pa.	175,000		

Approximate Capacity, 30,000,00

### CONTRACTORS

The Barnett and Record Company and the Barnett-McQueen Company



# Experience and Its Silo Builder

By far the greater part of these elevators are of relatively recent erection, the construction being dictated by many years of flawless record, in all instances embodying the use of the Natco standard of material and method. Note the number of railroads represented in the list, and the prominence of the concerns named.

The silo builder can have no better guide than the aggregate experience of these leading grain elevator operators. Significance does not pertain to hollow tile construction in general. Its value lies in the fact that the Natco standard alone is singled out as the approved construction for grain elevators as well as silos.

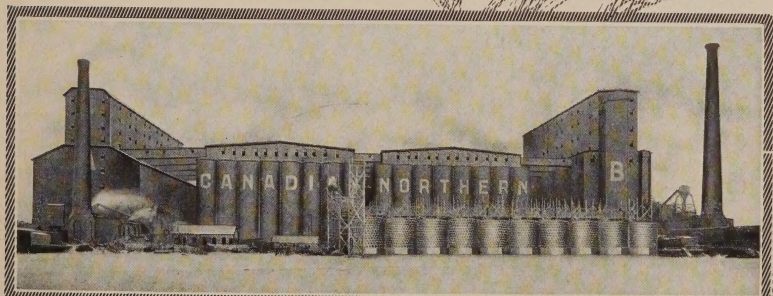
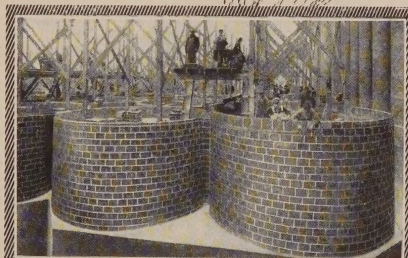
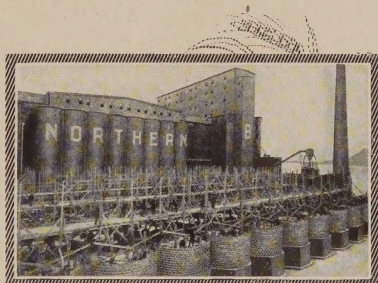
## NATIONAL FIRE PROOFING COMPANY

Organized 1889

NEW YORK

PITTSBURGH

CHICAGO





THE WOOLWORTH BUILDING  
New York City

Cass Gilbert, Architect

55 Stories; 775 feet in height; covers  
a ground area of over 30,000 sq. feet.  
Estimated cost, - - \$7,500,000.



Fireproofed with

**NATCO  
HOLLOW TILE**

The standard product of the National Fire Proofing Company. Over 30,000 tons used in the fireproofing of this gigantic structure, the largest office building in the world.

This Company is ready at all times to assist in the solution of any problem of fireproofing upon the receipt of the necessary data.

**NATIONAL FIRE PROOFING  
COMPANY**

Organized 1889

NEW YORK - PITTSBURGH - CHICAGO



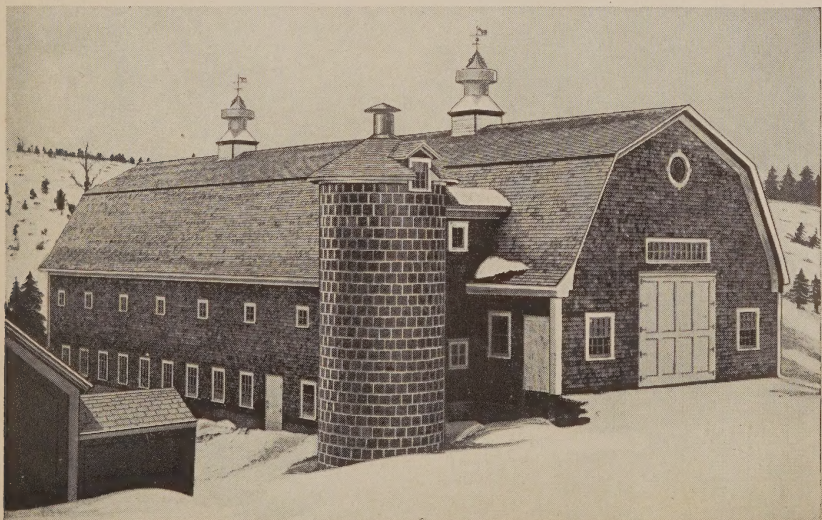
A 14x30 Natco Imperishable Silo on farm of Houghton Bros., Redford, Mich. Erected 1912.



## OUR POLICY

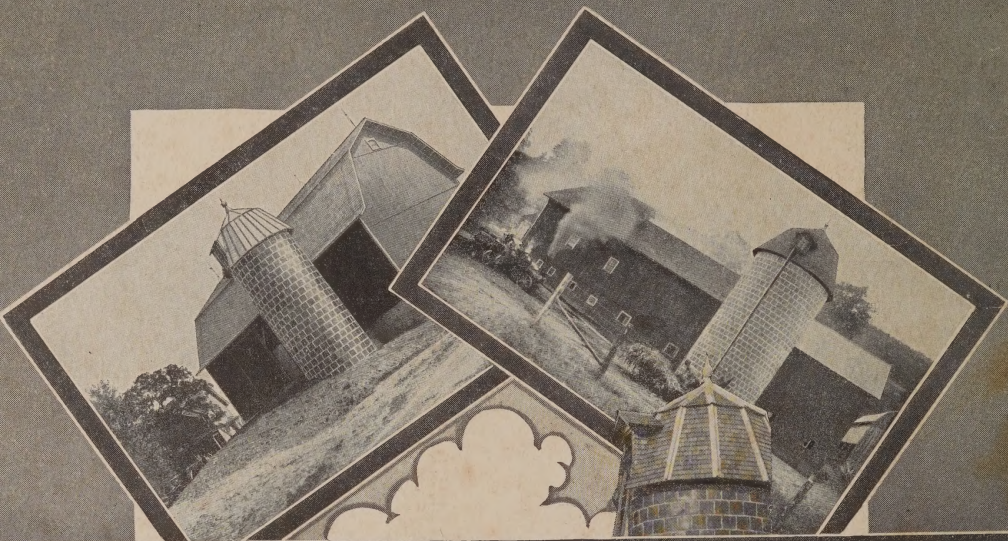
We have endeavored to make the Natco Imperishable Silo and all other Natco products the standard of construction, and our dealings the standard of fairness—and we have succeeded.

Our claims as to durability, low cost of upkeep, perfect feed preservation, convenience, attractiveness, etc., are involved in a binding guarantee and a policy of satisfaction to every customer, backed by the entire resources of the National Fire Proofing Company.



A 12x32 Natco Imperishable Silo on farm of Billy B. Van, Lake Sunapee, N. H. Built 1913.





# NATCO IMPERISHABLE SILO

